DOCUMENT RESUME

ED 467 080 PS 030 543

AUTHOR	Redd, Zakia; Brooks, Jennifer; McGarvey, Ayelish M.
TITLE	Background for Community Level Work on Educational Adjustment in Adolescence: Reviewing the Literature on Contributing Factors.
INSTITUTION	Child Trends, Inc., Washington, DC.
SPONS AGENCY	John S. and James L. Knight Foundation, Miami, FL.
PUB DATE	2001-12-00
NOTE	123p.
AVAILABLE FROM	Child Trends, 4301 Connecticut Avenue, NW, Suite 100, Washington, DC 20008 ($20). Tel: 202-362-5580; Fax: 202-362-5533. For full text: http:/ /www.childtrends.org/PDF/KnightReports/KEducation.pdf.
PUB TYPE	Information Analyses (070)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS
DESCRIPTORS	Academic Achievement; *Adolescents; Aspiration; *Community Programs; Educational Attainment; Expectation; High Schools; Intervention; Literature Reviews; Middle Schools; Program Effectiveness; Self Concept; *Student Adjustment; Student Motivation; *Well Being; *Young Adults; *Youth Programs
IDENTIFIERS	Indicators; Student Engagement

ABSTRACT

Given the importance of adolescents' educational adjustment, a key question for those concerned with improving adolescent functioning is what can be done to increase adolescents' levels of educational functioning. This review addresses a number of broad facets of adolescents' educational functioning, including those in the psychological domain--achievement motivation, academic self-concept, school engagement, and educational expectations and aspirations--as well as those in the concrete academic domain--academic achievement and educational attainment. The review focuses on aspects of adolescents' daily lives that have been demonstrated to influence their well-being in the current research literature. For each educational outcome, the review concentrates on characteristics of the adolescents, their families, their peers, and their broader communities that have been shown to relate to their educational adjustment. Also discussed are intervention programs targeted at adolescents and their environments that have been demonstrated to improve adolescents' educational adjustment. The review is limited to rigorously evaluated experimental evaluations of intervention, longitudinal studies, and meta-analyses. The review concludes with a summary table delineating areas for targeted intervention activities, effective and ineffective interventions, and "best bets" for interventions at the individual, family, peer, school, and program level. (Contains 221 references.) (KB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 467 080

Child TRENDS

Background for Community Level Work on Educational Adjustment in Adolescence: Reviewing the Literature on Contributing Factors

By
Zakia Redd, Jennifer Brooks, and Ayelish M. McGarvey

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY
Carol A. Emig
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
2A

Principal Investigator: Kristin A. Moore
Project Director: Jonathan F. Zaff

ED 460543

December 2001

Prepared for the John S. and James L. Knight Foundation

BEST COPY AVAILABLE

Acknowledgements: We thank our external reviewers, Dan Goldhaber, senior research associate at The Urban Institute's Education Policy Center, Adena Klem, Research Manager for the Institute for Research and Reform in Education, and Nancy Sharkey, doctoral student at Harvard School of Education's department of Administration, Planning & Social Policy, for their time and many helpful comments. We thank the John S. and James L. Knight Foundation for contributing to this document by providing funding and also valuable insight regarding its form and content. In particular, we acknowledge John Bare. We also thank the project manager, Jonathan Zaff, for his invaluable role in shaping this document.

Table of Contents

Introduction 5

Methodological Guidelines for this Review 5

Structure of This Report 6

PSYCHOLOGICAL INDICATORS OF EDUCATIONAL ADJUSTMENT 8

Academic Self-Concept 9
Introduction 9
Antecedents 9
Summary 14
Achievement Motivation 15
Introduction 15
Antecedents 16
Summary 20
School Engagement 21
Introduction 21
Antecedents 22
Summary 31
Educational Aspirations and Expectations 32
Introduction 32
Antecedents 33
Summary 38
Summary of antecedents of psychological indicators of educational adjustment 39
Individual-level antecedents 39
Family-level antecedents 40
Peer-level antecedents 41
Neighborhood/Community/School-level 42
Programs that have been documented to increase adolescents' psychological adjustment to school 43

ACADEMIC INDICATORS OF EDUCATIONAL WELL-BEING 44

Academic Achievement 44
Introduction 44
Antecedents 44
Summary 63
Educational Attainment 65
Introduction 65
Antecedents 65
Summary 81
Summary of antecedents of academic indicators of educational adjustment 83
Individual-level antecedents 84
Family-level antecedents 84
Peer-level antecedents 85
Neighborhood/Community/School-level 85

Programs that have been documented to increase adolescents' academic adjustment to school and educational attainment 86
Common Themes and Overall Conclusions 87
Conclusions 89
References 91

Summary Table: Review of the Research Literature and Implications for Targeted Programs and Activities to Promote Positive Educational Development Among Adolescents 103

Introduction

The education of American youth is widely considered an important goal in the United States. The issue of how American youth are faring in their schooling (referred to here as their educational adjustment or educational functioning), both compared to others within their own society and compared to youth in other countries, has received a great deal of attention in public debate. Indeed, there are strong arguments for why we should place such a significant focus on educational adjustment. Levels of academic achievement during adolescence and educational attainment later in life are strong predictors of a variety of indicators of well-being in adulthood, including, but not limited to, indicators of economic functioning such as socioeconomic status and income (Entswisle, 1990; Kane and Rouse, 1995; Miller, Mulvey, and Martin, 1995). For instance, adolescents who achieve academically are more likely to graduate from high school and to attend college (McNeal, 1995; Cairns, Cairns, and Neckerman, 1989). Further, academic and cognitive achievement, as indicated by test scores, is predictive of adult wages (Blau and Kahn, 2000; Murnane, Willett, and Levy, 1995). Higher educated people are found to be healthier and report to have higher levels of socioemotional well-being (Ross and Wu, 1995). Family-level outcomes, such as marital disruption, and outcomes of children, such as academic and cognitive skills, are also predicted by the level of education completed by individuals (Bumpass, Castro Martin, and Sweet,1991; Conger, Conger, and Elder, 1997; Moore and Snyder, 1991).

Given the importance of adolescents' educational adjustment, a key question for those concerned with improving adolescent functioning is what we can do to increase adolescents' levels of educational functioning. To address this question, this document discusses the many aspects of experiences in adolescents' lives that affect their educational adjustment. The document addresses a number of broad facets of adolescents' educational functioning, including those falling in the psychological domain—achievement motivation, academic self-concept, school engagement, and educational expectations and aspirations, as well as those falling in the more concretely academic domain—academic achievement and educational attainment. These sections cover the aspects of adolescents' daily lives that have been demonstrated to influence their well-being in the current research literature (the "antecedents" of educational adjustment). For each educational outcome, the review concentrates on characteristics of the adolescents (individual-level factors), their families (family-level factors), their peers (peer-level factors), and their broader communities (neighborhood/community/school-level factors) that have been shown to relate to their educational adjustment. Given that the goal of this document is to inform the development of effective programs for enhancing youth outcomes, we also discuss the intervention programs targeted at adolescents and their environments that have been demonstrated to improve adolescents' educational adjustment.

Methodological Guidelines for this Review

The importance of the topic of adolescents' educational adjustment has resulted in hundreds, perhaps thousands, of studies investigating the factors that predict various educational outcomes in adolescence. Hence, a complete review of the research investigating antecedents of these factors would be nearly impossible. Further, this sort of exhaustive literature review would also require a great deal of discussion of research methodology, since the quality of individual

studies of adolescent educational functioning varies tremendously, limiting its accessibility to the layperson. Hence, to limit the number of studies needing to be reviewed and to establish a minimum criterion for the quality of the research being reviewed, we limit our research to rigorously evaluated experimental evaluations of interventions, in which aspects of the environment are manipulated and educational outcomes are examined; and longitudinal studies, through which the influence of different factors on educational outcomes is examined over time, using multivariate analyses to control for background characteristics.

We have emphasized these types of studies for several reasons. Experimental studies (those in which individuals are randomly-assigned to either a program or a control group) represent the most rigorous research design for controlling what researchers refer to as "selection bias", the tendency for individuals to select into their environments, making it difficult to attribute differences to the experience of being in the environment itself. Experimental studies provide the only research design that allows researchers to attribute causality to the relationship under investigation. Multivariate longitudinal studies, considered the "next best" research design, allow researchers to examine change over time in individuals' experiences and well-being, providing a research greater confidence in assessing the direction of effects under consideration. Further, these studies typically control for key variables that might be involved in individual's selection into environments, thus attempting to minimize any selection bias in the study design. Note, however, that the extent to which these studies "control" for important variables varies tremendously, hence we will at times emphasize the level of control implemented in studies in which there is only limited evidence of a relationship from a small number of studies. Further, we limit our examination of cross-sectional studies, which examine predictors and outcomes at the same point in time, to certain substantively important topics for which the only evidence existing is cross-sectional, since it is impossible to distinguish cause from effect in these studies.

Finally, for some topics where research on educational outcomes is well-established, we include data supplied from meta-analyses, a methodology that is used to summarize the effects of several studies on the same topic.

Since the focus of this paper is on adolescents, we have further restricted studies to those that measure outcomes during adolescence or, for measures of college attendance and educational attainment, early adulthood. We primarily include longitudinal or experimental studies that begin in childhood or early adolescence and examine adolescent outcomes, meaning we are mainly focused on secondary school (middle through high school) outcomes. Therefore, studies that have outcome data only on younger children are not considered. For postsecondary attendance, individuals are included in the review through age 22, and for postsecondary completion, we included one study in which respondents were age 30 at the final follow-up.

Structure of This Report

The list of important indicators of educational adjustment is rather extensive and crosses a number of different, though inter-related, domains. For instance, scores on achievement tests and course grades can provide information about the level of "skills" individuals have acquired in a given topic area. Likewise, indicators of progress through school grade-levels and classes, such as grade retention or special education, can offer information about the state of an

adolescent's performance in school. Further, educational attainment in and of itself, even in the absence of information on their level of skills, can provide important information about an individual's likely future prospects, since educational degrees can serve as important "signals" to employers about whether an individual is likely to adjust well and work hard at a job.

While discussions and debates about the educational adjustment of American youth seem to focus increasingly on these more scholastic indicators of educational adjustment, a great deal of information can also be gleaned from indicators of adolescents' psychological orientation to education. Adolescents' feeling about their academic competence, as well as their motivation for pursuing academic tasks, their attachment and investment in school, and their hopes and expectations for their academic future can have important implications for their later educational well-being. Indeed, these factors have been demonstrated to predict test scores, grade point averages, course selections, and overall educational attainment (e.g., Marsh, 1994; Connell, Spencer, & Aber, 1994), and therefore are important indicators of adolescents' educational progress. Given the importance of these components of adolescents' educational progress, the first section of our paper focuses on key psychological indicators of educational adjustment. The second section of our paper covers the antecedents of the more traditional indicators of educational well-being, including academic achievement, as indicated by grades and test performance, grade repetition, high school completion, and college attendance, and to a lesser extent, college graduation.

The large empirical literature in the education field precludes our ability to provide an exhaustive review of the antecedents of each of these factors. Rather, we focus on the patterns of association available in recent (post-1985) longitudinal studies, providing an overview of the general themes in this research. We present each individual component of educational adjustment separately, providing a brief overview of the domain under consideration and then describing the individual-level, family-level, peer-level, neighborhood/community/school-level, and intervention programs known to predict well-being within that domain. Due to the criteria used for this selective literature review, we are not able to address all factors in adolescents' experiences that serve to promote positive educational development. However, the review is fairly complete in its description of the key indicators and programs that have been documented to be important predictors of adolescent educational adjustment in fairly rigorous research, suggesting that those antecedents that we do cover are generally well-supported in the research.

Noteworthy Issues and Concerns

In describing the aspects of adolescents' lives that have been found to predict their later educational adjustment, we will at times venture into topics that have been extremely controversial in debates about education. For instance, differences in educational adjustment for adolescents of different racial or ethnic backgrounds have been documented in some instances. Likewise, differences in adjustment for boys and girls will be highlighted for certain outcomes. The most controversial topics tend to center around characteristics of individuals that are immutable (such as race and sex), as well as features whose malleability itself is controversial (such as IQ). In order to maintain consistency throughout the document, we will not discuss the wide array of theories proposed to explain these differences – hence, we do not attempt to establish <u>why</u> these differences have come about. Rather, we emphasize that no single antecedent described here is a sole determinant of an individual's educational adjustment

(indeed, if this were true there would only be a single antecedent for each outcome). The number of antecedents described for each indicator of educational adjustment suggests that any given antecedent must be considered in conjunction with all the others its influence on educational adjustment. Further, given that it would be impossible to change immutable characteristics of individuals (such as their race or sex), we note that these factors are discussed with the goal of helping programs identify which populations are most at-risk with respect to a given outcome.

Thorough literature searches have produced very little rigorous research on a number of policies and reform efforts being introduced nationally and by schools and districts across the country. Much of the research that has been conducted on such topics as school choice/charter schools, high stakes testing, exit exams, university-school partnerships, school uniforms, school size, dropout prevention programs, privatization of public schools, and standards-based reform efforts has not met our standards for inclusion. Very few are experimental or longitudinal in design; the studies are often cross-sectional and do not control for other factors that may contribute to changes in outcomes. Many more of the studies are qualitative in design using methods such as case studies, or do not examine the implications of these policies for adolescents' educational success (providing descriptions of the implementation of these policies, for example). Further, as our focus is on adolescents, studies that meet our methodological criteria, but only document relationships between younger children and educational policies and reforms, such as Success for All and Reading Recovery, are not included. (For some examples of educational programs, policies and whole school reform efforts that have undergone some review, please see the following: Dynarski & Gleason, 1998; Fashola & Slavin, 1997 and 1998; Gill, Tempane, Ross, &Brewer, 2001; Herman, Aladjam, McMahon, Masem, Mulligan, Smith, O'Malley, Quinones, Reeve, & Woodruff, 1999; and Northwest Regional Educational Laboratories & The National Clearinghouse for Comprehensive School Reform, 2001).

While any significant predictor of an adolescents' educational adjustment is notable, it is also important to point out that some predictors or types of predictors more strongly predict educational outcomes than others. Effect sizes, or the degree or strength to which a set of factors (individual-level, family-level, etc.) may predict a given outcome, are not reported in this review as the information needed to produce them is not available in many of the studies that were reviewed. However, based on our review of the literature, we generally find that individual-level predictors, such as prior ability and individual behavioral traits, are stronger than others in predicting a young person's educational adjustment. Family-level factors, such as income and parental education, are also strong predictors of educational outcomes, but less so than individual-level factors overall. School/neighborhood-level factors and societal/policy-level factors predict educational outcomes to a much lesser degree than do individual- and family-level factors. Lastly, some programs are able to impact educational outcomes, yet they generally have a much smaller impact than other influences in an adolescents' life. It is important to take this into consideration when reading this review.

PSYCHOLOGICAL INDICATORS OF EDUCATIONAL ADJUSTMENT

We turn now to a discussion of four psychological indicators of adolescents' educational adjustment: academic self-concept, achievement motivation, school engagement, and educational aspirations and expectations. As noted above, these factors are important indicators of

adolescents' orientation toward academics and have been demonstrated to predict other important facets of educational adjustment, such as school grades (e.g., Marsh, 1994; Connell, Spencer, & Aber, 1994). We note the inter-relatedness of these factors – the reader will find that they are frequently listed as individual-level antecedents of one another. Likewise, we note the relationship of these factors to other aspects of educational adjustment, such as test scores and grades, which are not only affected by these indicators, but have also often been shown to be important predictors of them.

Academic Self-Concept

Introduction

The first construct, academic self-concept, refers to an individual's perception of his or her level of competence or ability within the academic realm. Because academic self-concept is linked to both adolescents' motivation to succeed in school (Henderson & Dweck, 1990) as well as their academic performance, it is considered an important component of an adolescent's educational well-being (Henderson & Dweck, 1990; Marsh & Byrne, 1999; Harter, Runbaugh, Whitesell, & Kowalski, 1992).

The structure of the academic self-concept seems to include a global dimension, referring to individuals' sense of competence in school or academics generally, as well as a more differentiated dimension focused on distinct areas of academic work, such as science or math (Hay, Ashman, van Kraayenoord, & Stewart, 1999). While domain-specific self-concepts bear a stronger relationship to individuals' achievement within that domain, the global academic self-concept can also have important implications for individuals' overall academic functioning (Marsh & Yeung, 1998). Hence, our review of the literature will focus on research examining domain-specific aspects of academic self-concept, as well as that investigating more global dimensions of this construct.

Antecedents

Individual

The research literature has suggested a number of individual-level characteristics that can influence an adolescent's academic self-concept. As might be expected these include individuals' prior academic progress, such as prior levels of achievement. Yet, research also suggests that adolescents' experiences outside of the academic realm, such as their employment experiences, affect their feelings of competence in school.

Within the school domain, studies have suggested that prior ***academic achievement*** may be an important influence on an adolescent's academic self-concept. For instance, Marsh & Yeung (1997) found that not only can adolescents' levels of academic self-concept affect their later performance in school, their self-concepts are also influenced by their prior academic achievement, as indicated by their grades and their test scores. Hence, the relationship between academic self-concept and academic achievement seems to be reciprocal in nature, with each affecting the other. The sample in this study, composed of 603 mostly white, Catholic boys from Australia, makes it difficult to draw generalizations about the extent to which this pattern would hold for all adolescents. Yet, a second longitudinal study (Marsh, 1994) examining a national sample of adolescents in the U.S. (the National Education Longitudinal Study of 1988) also found a link between students' test scores and grades, and their levels of academic self-concept,

lending support that these findings are probably not specific to the sample in the Marsh &Yeung (1997) study. Additionally, this second study found that the path from students' earlier test scores in a given domain to their later levels of academic self-concept in that domain occurs mostly through the grades they receive within that subject – in other words, students who score well on tests tend to receive higher grades in school, which in turn leads to their having higher levels of academic self-concept.

In addition to the reciprocal relationship between achievement and academic self-concept, it also appears that adolescents' academic self-concepts in a given domain can be affected by their ***achievement within another academic domain***. For instance, a study following a national sample of adolescents for a three-year period found that adolescents' who received a high grade in one academic domain (e.g., math) demonstrated lower self-concepts within another academic domain (e.g., English) at a later point in time. This relationship was found in the presence of controls for earlier levels of English self-concepts and grades in English class, suggesting that the result is not due to differences in achievement or self-concepts at the start of the study. The authors of this study, along with other researchers interested in academic self-concept, suggest that adolescents form their academic self-concepts based on both internal and external frames of reference. In other words, the self-concept in a given domain is based not only on "external" indicators of competence in that area (such as grades or test scores), but also on relative performance in one domain compared to other domains. Hence, the better an individual performs in math, the lower his or her English self-concept will likely be and vice versa.

In addition to the influences of individuals' prior academic experiences, individuals' behavior outside of school can also affect their academic self-concepts. Specifically, a national study of high school sophomores (the High School and Beyond study) who remained within the same school for both their sophomore and senior years found that the greater the ***number of hours of employment*** students reported performing during their sophomore, junior, and senior years of high school, the lower their global academic self-concept (Marsh, 1991a). This relationship was found even controlling for the fact that those who work many hours are likely to differ from those who do not in a number of ways, such as in their prior academic skills, their academic track, the time they spend on homework, their school absences, their family background, and even their prior levels of academic self-concept.

Two studies have documented differences in adolescents' levels of academic self-concept by the *gender* of the adolescent. Marsh (1991a) found that girls held higher global academic self-concepts than boys in the High School and Beyond survey. Yet, in a second national survey (the NELS 1988 data set), Marsh and his colleague found that girls held higher English, but not math, academic self-concepts than boys (Marsh & Yeung, 1998). In fact, girls had <u>lower</u> math self-concepts than boys in this sample.

In sum, adolescents' self-concepts appear to be influenced by their academic achievement, with those who have higher levels of achievement also tending to have higher levels of academic self-concept. Yet, this relationship is complicated by the inter-relationships between adolescents' academic self-concepts and their achievement in different areas of school, with those performing better in one area showing diminished levels of academic self-concept in another. Further, adolescents' experiences <u>outside</u> of the academic arena can also have implications for the levels of academic self-concept, with those who tend to work a greater

number of hours in high school also showing lower levels of academic self-concept. Finally, there is some evidence that girls have higher global and English academic self-concepts, but lower math self-concepts, than boys.

Family

There is far less research relating adolescents' academic self-concepts to their family circumstances than to their individual characteristics or other aspects of their environments. Only a single study was identified that documented a relationship between the characteristics of adolescents' family environments and their levels of academic self-concept. King (1994) found that higher levels of ***financial support from non-residential fathers*** were related to higher levels of global academic self-concept in a national sample of children ten years or older who were living in a separate home from their fathers (King, 1994). This study accounted for a number of other factors, such as the mother's wedlock status at the time of the child's birth, the child's distance from his or her father, and the family's economic status. However, because this study was non-experimental in design, a causal relationship between child support and academic self-concept cannot be determined.

Peers

As was the case for family-level variables, the literature relating academic self-concept to adolescents' relationships with their peers is extremely limited. Only a single longitudinal study investigating the role that peers play in shaping adolescents' academic self-concept was identified. Murdock, Anderman, and Hodge (2000) examined the relationship between the ***educational aspirations of adolescents' peers*** and their own levels of academic self-concept in a study of 240 mostly African American or Caucasian students in a mid-Atlantic school. The findings suggested that adolescents who perceived their peers as holding higher educational aspirations in 7th grade held higher academic self-concepts in 9th grade than those who perceived their peers as holding lower educational aspirations. This finding held even after controlling for several other variables, such as their prior levels of achievement and academic self-concept. However, it is important to note that the measure of peer aspirations was taken from students' own reports, not their peers' reports, and may therefore tell us more about the benefit of adolescents' perceiving their peers as holding high aspirations as much as the benefit of adolescents associating with peers who hold high aspirations.

Community/Neighborhood/School

There is a larger body of literature examining the link between adolescents' school environments and their levels of academic self-concept than that focusing on their family or peer environments. For instance, one study examined the relationship between different school-based programs for students with special needs and adolescents' levels of academic self-concept. A second study focused on the academic and economic composition of the student body in adolescents' schools and its relationship to adolescents' academic self-concepts. Finally, a third study examined the implications of tracking in schools for adolescents' self-concepts.

The first paper examined the relationship between ***classes for gifted and talented students*** and students' academic self-concepts in two separate, but rather small studies (Marsh, Chessor, Craven, & Roche, 1995). The studies compared academically talented students who were enrolled in classes for gifted and talented students to a comparison group of students who were not enrolled in these classes but were matched on key variables such as academic competence,

IQ, sex, and age. The students were between 10 and 12 years of age at the start of the studies and were followed for a period of a year. In both studies, the authors found that students enrolled in the gifted and talented classes experienced significantly greater declines in self-concept between the time they first started the class and up to two semesters later than those in the comparison group. This was true both for global measures of academic self-concept, as well as for domain-specific measures. The authors of this study suggested that the findings indicate a "big fish, little pond" effect, in which the academic self-concept of an adolescent in a less competitive class (e.g., a mixed ability class as compared to a class of gifted students) will be higher than it would be if he or she were enrolled in a more competitive class, since the adolescent's level of achievement can compare more favorably to a class in which there are students with lower skills. Yet, the treatment groups in these studies were extraordinarily small, with only about 20 people receiving the programs. Therefore, these findings should be considered with caution.

A second study examined whether a similar "big fish, little pond" effect would be evident at the school-level in which there is a higher average level of ability among the student body. This study examined the relationship between a ***schools' average level of student ability*** and adolescents' academic self-concept within a national sample of adolescents who attended a single high school for both the 10th and 12th grades (Marsh, 1991b). The findings of this study suggested that students attending schools with a higher mean level of ability (based on the average test scores for students in a variety of subjects) tend to have lower levels of academic self-concept in 12th grade than students attending schools with a lower mean level of ability. This relationship held true even when attempts were made to account for any differences in the adolescents' socioeconomic status, gender, 10th grade test scores, prior coursework and GPA, the average socioeconomic status of students in the school, and even individuals' earlier levels of academic self-concept. Marsh replicated these findings in a different national sample of adolescents, as well (Marsh, 1994), finding again that the average school achievement related negatively to adolescents' academic self-concept and that this relationship occurred largely through differences in the grades that students received in schools with higher and lower levels of ability. The author of these studies suggests that the findings provide more evidence of a "big fish, little pond" effect operating at the school level.

A third study suggests a link between ***school tracking*** and adolescents' levels of academic self-concept (Ireson, Hallam, & Plewis, 2001). A cross-sectional study of 13- to 14-year old students in 45 secondary comprehensive schools in Britain found that students in schools that used tracking in many, but not all of their classes had higher levels of academic self-concept than students in schools that had mostly mixed ability classes and schools in which the majority of classes were tracked. The authors also found that the relationship between tracking and academic self-concept was greater for students' self-concepts in English than those in math or science. Although this finding comes from a cross-sectional analysis, and therefore is limited in its ability to indicate a causal relationship, the authors controlled for a few important variables that might predict whether students enroll in schools using greater or lesser tracking, such as the student's economic status, and also controls for their prior levels of achievement on a number of standardized tests.

A fourth study touched on a variable examined the classroom characteristics related to eighth

grade students' academic self-efficacy, their sense that they can succeed in academics. Ryan and Patrick (2001) examined the relationship between teachers' levels of support for their student-teacher relationships, the extent to which they promote social interaction between students, the extent to which thy promote mutual respect between classmates, and the extent to which they emphasize performance goals in a sample of over 200 students from three ethnically diverse middle schools in the Midwest. Their study suggested that 8th grade students whose teachers place more emphasis on mutual respect between classmates tend to feel more efficacious in their schoolwork than those whose teachers place less emphasis on mutual respect. This relationship held even with controls for the students' levels of motivation and academic achievement in 7th grade.

Overall, the literature has documented relationships between a number of characteristics of adolescents' school environments and their levels of academic self-concept. There is some evidence that gifted adolescents who are placed in special classes for the gifted and talented hold lower academic self-concepts than those who are not placed in these classes. Further, there is evidence that students whose classmates have higher average levels of achievement tend to hold lower levels of academic self-concept than those whose classmates have lower levels. Both of these effects suggest that adolescents' academic self-concepts fare more poorly when adolescents are surrounded by more advanced students, presumably because they are less likely to compare favorably to their classmates. Yet, a third study suggests that moderate amounts of tracking in school curricula are related to higher levels of academic self-concepts than greater or lower levels of tracking. Finally a fourth study suggests that greater promotion of respect between classmates by teachers is linked to higher levels of perceived efficacy in academics.

Programs affecting academic self-concept

One study found a link between participation in ***mentoring programs*** (specifically the Big Brothers/ Big Sisters program) and academic self-concept in a sample of at-risk children ranging from elementary to high school age (Rhodes, Grossman, & Reche, 2000). Using an experimental design, this study documented that children participating in the mentoring program had higher perceived scholastic self-competence than those not participating. While not focused exclusively on adolescents, this study provides some initial evidence that mentoring programs may have beneficial effects on adolescents' self-concepts, a notion that should be explored further in future research.

Finally, a second project focused on the effects of different types of ***programs for students with learning disabilities*** reported in 64 different studies, many of which were focused specifically on adolescents and all of which compared a "treatment group" that received the program to a "comparison group" that did not receive the program (Elbaum & Vaughn, 2001). The authors of this analysis reported that, averaging across the different studies, these programs appear to have a positive effect on academic self-concept, with those in the treatment group showing higher levels of academic self-concept than those in the control group. Further, there is some evidence that the effects on academic self-concept are larger in samples of middle school students than those of high school students, and are only significant for programs with an academic (e.g., peer tutoring, cooperative learning) or counseling (i.e., affectively-oriented programs) focus for middle school students and with a counseling focus for high school students.

Summary

In sum, an adolescent's sense of competence within the academic realm can be an important indicator of his or her academic functioning, having implications for both the coursework he or she selects in school as well as the level of achievement he or she attains within those areas of study.

A number of factors seem to be important predictors of adolescents' levels of academic self-concept, including variables at the level of the individual, the family, the peer network, and the school, with the school and individual levels having received the most attention in the current research. Likewise, a couple of studies have documented links between different types of intervention programs and adolescents' academic self-concept.

With regard to the characteristics of the adolescents themselves, individuals' levels of achievement seem to affect how competent they feel in the academic realm. These effects can occur both broadly, as well as within specific domains of academic, with achievement in one academic domain appearing to have a negative effect on self-concept in another. This finding does not imply that a program should promote failure in one subject in order to increase self-concept in a different subject.

In terms of adolescents' experiences with their families and peers and experiences outside of the school realm, adolescents' employment experiences, the contributions their families receive from non-residential fathers, and their perceptions of their peers' educational aspirations all seem to have important implications for their academic self-concepts. For instance, those who work fewer numbers of hours during high school tend to have higher academic self-concepts. Further, those who report that their peers have higher educational aspirations tend to hold higher academic self-concepts themselves.

A number of school-level factors and intervention programs also seem to be important in predicting adolescents' academic self-concepts. For those with learning disabilities, receiving an academic or counseling program targeted at students with learning disabilities is related to increases in academic self-concept. In contrast, specific classes targeted to academically talented or gifted students appear to lead to lower self-concepts among the gifted population. This latter finding seems to indicate a drawback to adolescents' being surrounded by more competent peers -- an effect that is supported by the finding that adolescents from schools with higher levels of average achievement tend to hold lower academic self-concepts. Yet, there also appears to be a positive relationship between schools' moderate use of academic tracking and adolescents' levels of academic self-concept, a finding suggesting that perhaps this effect is only apparent in the extremes. Finally, there is some evidence of a relationship between participation in a mentoring program and adolescents' academic self-concept.

While we have described a number of studies suggesting important predictors of adolescents' levels of academic self-concept, it is important to note that this research is far from conclusive. The findings have typically not been replicated across multiple studies. Further, almost all of the

studies documenting predictors of academic self-concept have been correlational in design, and some were even cross-sectional, making it impossible to determine the causal direction of the relationship under consideration.

Achievement Motivation

Introduction

The second indicator we address in this section, achievement motivation, refers to the structure of a person's desire to succeed or achieve in academics. Students' achievement motivation is an important predictor of the type of coursework they select, the effort they put into their work, and their overall levels of educational attainment, and therefore an important predictor of success in later life (Grolnick, Ryan, & Deci, 1991; Harter et al., 1992; Vallerand, Blais, Briere, & Pelletier, 1989; Whitehead, 1984).

A number of different components of students' beliefs about success in school have been emphasized in the literature on achievement motivation. For instance, one theory primarily emphasizes individuals' beliefs about the reasons for their successes or failures in school, such as whether they believe their successes or failures are due to luck or effort and ability, and how these beliefs influence later efforts in school (Weiner, 1985). According to this theory, those who blame their failures on a lack of ability but do not attribute their successes to their ability are less likely to succeed in school (Weiner, 1985).

A second perspective stresses the importance of whether a student pursues academic tasks with the goal of achieving personal improvement and understanding (referred to as a mastery goal) or the goal of doing well in school (referred to as a performance goal) (Ames, 1992). This theory suggests that individuals who hold performance goals are concerned primarily with documenting their ability in a given area, and hence are more likely to get discouraged when confronted with challenging work. As a result, individuals holding a performance goal are less likely to pursue challenges or persist in the face of failure. Those who hold learning goals, however, are more apt to see challenges as mechanisms for increasing their learning, and therefore more apt to enter into situations that will test their abilities (Ames, 1992).

Possibly the most widely discussed issue in the education field pertaining to achievement motivation is the distinction between extrinsic and intrinsic motivation. This distinction flows from self-determination theory, which emphasizes the degree to which an individual behaves based on his or her own volition, and is highly related to the emphasis on goals described in the paragraph above (Deci & Ryan, 2000). With regard to academic achievement, this theory emphasizes *why* students pursue goals and strive for success in the classroom and makes a critical distinction between tasks that are performed because they have value to the student in and of themselves (intrinsically motivated tasks), and those that are performed because they are rewarded by others (extrinsically motivated tasks) (Deci & Ryan, 1985; Ryan & Deci, 2000).

Students who are intrinsically motivated receive satisfaction and pleasure from learning or accomplishing things, or from the stimulation they get from pursuing a task. Students who are extrinsically motivated, however, pursue work because: they are pressured to do it (extrinsic

regulation); they pressure themselves to do it (introjected regulation); or because they have decided to do it, despite its having no interest to them (identified regulation). According to self-determination theory, intrinsic motivation, the three forms of extrinsic motivation, and amotivation (i.e., a lack of either intrinsic or extrinsic motivation) fall along a single dimension of self-determination. The least self-determined behavior is amotivational, followed by behavior motivated by external regulation, introjected regulation, and identified regulation. Behavior that is intrinsically motivated represents the most self-determined form of action (Ryan & Deci, 2000).

Intrinsic motivation is considered the most positive and most adaptive form of achievement motivation. Intrinsically motivated children pursue a goal because of the pleasure they get from pursuing it. As such, they are more likely than those who are extrinsically motivated to pursue challenges that may not be rewarding or in which they face a chance of failure (Ryan & Deci, 2000).

The research described below will emphasize all components of achievement motivation, including both whether students hold learning or performance goals, and the level of intrinsic motivation or self-regulation endorsed by a student. The important antecedents of achievement motivation at the individual-, family-, peer-, and neighborhood/community/school-levels will be discussed below.

Antecedents

Individual

A number of studies have examined the individual-level influences on the structure of adolescents' achievement motivation. These studies have focused on adolescents' perceptions of their own ability in the academic arena (their academic self-concept, as discussed earlier in this section), their feelings about school and education, and their prior educational experiences. Additionally a few studies have examined differences in achievement motivation for boys and girls, which can provide information about whether adolescents' of a given sex are more educationally at-risk in this domain than those of the other.

With regard to adolescents' sense of the academic competence, one study found that lower- to upper-middle class students who experienced an increase in ***academic self-concept*** between 7th and 9th grade tended to experience a sizeable increase in intrinsic motivation over this period (Harter et a., 1992). In contrast, those who did not experience a change in academic self-concept experienced only a slight increase, and those who experienced a decline in self-concept experienced a decline in achievement motivation over this same period. This finding occurred even while controlling for earlier levels of academic self-concept, allowing the authors to all but rule out that the relationship between academic self-concept and achievement motivation was due to selection effects.

In addition to their sense of their own academic competence, adolescents' affective orientation toward their schools appears to have important implications for their achievement motivation. One study examined the relationship between students' ***feelings of belonging at***

school, adherence to school rules, and interest in social status at school and their achievement motivation, specifically their endorsement of mastery and performance goals (Anderman & Anderman, 1999). The authors of this study found that students who placed greater importance in being liked by their classmates, and being liked by the "popular" crowd specifically, in 6th grade were more likely to hold performance goals (e.g., emphasizing the importance of doing well) than those who did not place as strong an emphasis on their social contacts at school. In contrast, those who reported feeling a greater sense of belonging at school and those who believed it was important to adhere to school rules were more likely to endorse mastery goal orientations (e.g., emphasizing the importance of mastering the topic), and at times less likely to endorse performance goal orientations, over the period. This finding occurred in an economically and ethnically diverse sample of about 660 adolescents, and was found even after accounting for differences in students' earlier levels of academic self-concept and achievement.

The findings from another study suggest that adolescents' earlier levels of academic adjustment have implications for their later achievement motivation. In a sample of urban, African American junior high school students, Connell and Halpern-Felsher (1997) found that adolescents with higher levels of ***educational risk behavior*** (including low attendance, low standardized test scores, suspensions, course failure, being below the grade level expected for one's age) reported being less self-regulated in school[1]. However, it is important to note that, while this study examined multiple variables over time, the relationship between educational risk behavior and achievement motivation was examined at a single point in time. Therefore, it is impossible to determine the direction of causality in this relationship.

Finally, ***sex differences*** have been found in the achievement motivation of male and female adolescents, with girls generally showing more adaptive forms of achievement motivation than boys. For instance, Anderman, Maehr, & Midgley (1999) reported that boys were more likely to report performance goals and more extrinsic goals than girls in a sample of about 300 ethnically-diverse students transitioning from 5th through 7th grade in a working-class community. Likewise, Ryan (2001) reported higher levels of intrinsic motivation among 331 seventh grade girls than boys in an economically- and ethnically-diverse sample from an urban middle school.

Family

A couple of studies have also found that the family environment has important implications for adolescent's achievement motivation. These studies have concentrated on parental involvement in an adolescent's education and the level of cognitive stimulation provide in the adolescent's home when he or she was younger.

One study suggests that higher perceived ***adult involvement in the adolescent's education at home*** (e.g., caring about the adolescent's education, allowing the adolescent to have influence over decisions affecting him or her) was related to higher levels of self-regulation in learning in a sample of about 740 urban, African American junior high school students (Connell & Halpern-

[1] The relationship between adolescents' educational risk behavior and their self-regulation appeared to occur indirectly through the relationship between students' educational risk behavior and decreased perceived teacher support for their schooling, which in turn predicted lower levels of self-regulation (in other words, less intrinsic motivation).

Felsher, 1997). This relationship was found for both boys and girls in this sample of urban, African American junior high school students and was found even after controlling for adolescents' levels of prior educational risk behavior, such as their prior suspensions, levels of absenteeism, and test scores. However, it is important to note that the measures of adult involvement at home and achievement motivation were taken from a single point in time. Hence, it is impossible to determine whether students who are more intrinsically motivated elicit more support at home or whether more support at home leads to more intrinsic achievement motivation (or both).

Finally, another study found that living in a home with a more ***cognitively stimulating environment in childhood*** (at age 8) was related to higher levels of intrinsic motivation both in childhood and in adolescence (at age 13). The sample for this study was composed of mostly white, middle-class children and their families (Gottfried, Fleming, & Gottfried, 1998). The authors found that the relationship between the quality of the earlier home environment (e.g., whether the child was taken on trips and encouraged to develop hobbies, whether the child had access to a computer, whether the family learned about new and different things) and later achievement motivation occurred largely through the influence of living in a cognitively stimulating environment on early achievement motivation, which was related to higher levels of achievement motivation in adolescence.

Finally, the basic tenets of self-regulation theory suggest that ***parental autonomy granting*** ought to be related to students' achievement motivation, a hypothesis that is supported by a study examining the relationship between parental and teacher autonomy support and a small sample of adolescents in the U.S. and Russia (Chirkov & Ryan, 2001 - no differences in the pattern of relationships was found for Russian and U.S. students). The authors find that students whose parents provide greater autonomy have lower levels of extrinsic motivation and higher levels of identified regulation (a more self-regulated form of motivation). This study is cross-sectional in nature, and therefore should be interpreted with caution. However this study provides support for a relationship that has been identified in a number of studies using less direct measures of student motivation or with younger children or adults, and therefore should not be dismissed as invalid.

Peers

In contrast to the amount of research documenting links between adolescents' individual-level characteristics and their achievement motivation, only a single longitudinal study was identified that identified a relationship between adolescents' peer networks and their achievement motivation. Ryan (2001) examined the relationship between ***the level of achievement motivation among adolescents' peers*** and the change in their own levels of achievement motivation from the beginning to the end of seventh grade in an economically and ethnically diverse sample from an urban middle school. The findings of the study suggested that, while intrinsic motivation is generally declining across the seventh grade, adolescents whose peers were more intrinsically motivated at the start of the 7th grade experienced less of a decline in their own intrinsic motivation between the start and the end of the school year than those whose peers were less intrinsically motivated.

Neighborhood/Community/School

A set of studies has found relationships between the characteristics of the school environment or school-based approaches to learning and adolescents' achievement motivation. These studies generally found that the type of goals that are emphasized in the school environment, the teaching strategies used in the school, and adolescents' feelings of educational support from the adults at school all have implications for adolescents' achievement motivation.

In terms of school goals, two longitudinal studies suggest that the ***learning goals emphasized by adolescents' schools*** may have important implications for their own personal goals for learning. For instance, one study reported that, among students transitioning to middle school, those who perceived their schools as emphasizing the importance of mastering their material or tasks were more likely to endorse mastery goal orientations themselves in 6th grade than students who perceived their middle school as less mastery goal-oriented (Anderman & Anderman, 1999). This relationship held even after controlling for the adolescents' levels of achievement and motivation prior to their transition to middle school. Likewise, those who transitioned to middle schools that they perceived as emphasizing performance goals (performing well on the test or in the class) were more likely to endorse performance goals than those who transitioned to a school they perceived as less performance goal-oriented. This result was found in an ethnically diverse sample from 21 elementary schools in four ethnically- and economically-diverse school districts. A similar relationship between school performance goals and adolescents' performance goals was found in a second study by Anderman, Maehr, and Midgley (1999), who reported that 5th grade students who moved to a middle school emphasizing the importance of performance goals reported higher levels of personal performance goals in 6th and 7th grade than those moving to a school with less emphasis on these goals. In contrast, those who moved to a school that emphasized extrinsic performance goals (extrinsic rewards for doing well) were more likely to endorse extrinsic performance goals in 6th and 7th grade.

Yet, not all studies seem to find a relationship between performance goals and students' motivation. A third study of students in three ethnically diverse Midwestern schools (Ryan & Patrick, 2001) finds no link between teachers' emphasis of performance goals and eighth grade students reports of their self-regulated learning after controlling for students prior motivation and achievement, gender, race, and teachers levels of support, promotions of students' social interactions, and promotion of mutual respect between students. The differences in these studies findings might be related to the motivational constructs measured in these studies. Whereas the first two studies examined students' endorsement of academic goals, the third study examined students' reports of their actual behavior when completing academic work (e.g., whether they check their work when it's finished, whether they think about whether they understand what they are working on).

In addition to the importance of school goal orientations, the ***teaching strategies used in adolescents' schools*** can also have an influence on their achievement motivation. For instance, Nichols (1996) reported that the use of cooperative learning strategies[2] was related to higher endorsement of mastery goals, higher levels of intrinsic motivation, and lower endorsement of performance goals among a small, mostly Caucasian sample of high school students in a

[2] In this study, cooperative learning strategies involved assigning students to small academically heterogeneous groups of students with whom they would complete their assignments. Grades were assigned both individually and on the group level, with rewards provided to the most successful teams of students.

suburban midwestern school. Individuals in this study were randomly assigned to participate in a treatment group that learned geometry material through cooperative learning strategies, a second group that received the traditional teaching methods for the school for the first part of the year and cooperative learning strategies for the second, and a third group that was taught the same material using only the traditional teaching methods. The students who received the cooperative learning strategies had higher levels of intrinsic motivation and were less likely to endorse performance goals than their peers who did not receive cooperative learning strategies. Further, a second study of teenagers in New Zealand, though cross-sectional in design, supports the notion that cooperative learning strategies are related to adolescents' endorsing more favorable forms of achievement motivation (Townsend & Hicks, 1997). Finally, a third study found a relationship between greater levels of ***autonomy-granting by teachers*** and less extrinsically motivation, as well as more self-regulated motivation (Chirkov & Ryan, 2001). Although this study is cross-sectional design, it supports the findings of other studies suggesting that individuals' levels of autonomy in their environments are important factors in affecting motivation, more generally.

Finally, the ***level of support that adolescents receive from adults at school*** may have important implications for their achievement motivation. Connell and Halpern-Felsher (1997) found that higher levels of perceived adult support at school was related to higher levels of self-regulated motivation among a sample of African American adolescents in an urban junior high school. Yet, it's important to note that this portion of the study was cross-sectional in nature, making it impossible to determine the direction of the relationship between support from adults at school and adolescents' achievement motivation. However, Ryan and Patrick (2001) also find a link between eighth grade students' perceptions of their teachers' support, as well as their perceptions of teachers' emphasis on mutual respect between classmates, and their motivation in middle school in a sample of students from three ethnically diverse Midwestern middle schools. Further, the Ryan and Patrick (2001) study was longitudinal and controlled for prior levels of motivation and achievement, therefore providing further evidence supporting Connell and Halpern-Felsher's findings.

To recap, a handful of studies have suggested that the characteristics of adolescents' schools can have implications for their achievement motivation. Two studies suggested that the goals that are emphasized in school – the amount they focus on mastering tasks versus performing well – are both related to goals that adolescents' themselves endorse as important motivators for achieving, with adolescents tending to endorse goals that are emphasized in their school context. Further, another pair of studies – though both rather limited in their design – have suggested that the use of cooperative learning strategies in school is related to more positive achievement motivation. Finally, another study suggests that support from adults at school seems to lead to higher levels of achievement motivation.

Summary

In sum, adolescents' achievement motivation has important implications for adolescents' educational achievement and attainment, including the degree to which they pursue challenging classes and their academic achievement (Ryan & Deci, 2000).

A number of individual-level, family-level, peer-level, and school-level factors have been demonstrated to predict the form of achievement motivation endorsed by adolescents. Factors at the individual-level have received perhaps the greatest attention in the research literature. For instance, students' feelings about their academic competence, the degree to which they feel they belong at school, and their desire to make friends at school all have implications for their achievement motivation. Likewise, the extent to which they have experienced prior educational problems is related to their motivation to succeed in school. Finally, there is evidence that boys and girls may hold different forms of motivation in adolescence.

Far fewer studies have documented the characteristics of adolescents' families and peer relationships that have implications for their achievement motivation. Preliminary links have been found between the socioeconomic status of adolescents' families and their endorsement of particular forms of achievement motivation. Further, parental involvement in adolescents' schooling seems to have implications for the factors that motivate their adolescents' academic behavior, as does the amount of cognitive stimulation provided in the home when the adolescents were younger. The forms of motivation endorsed by adolescents' peers also seem to influence their own perceptions of reasons for performing well in school. However, more research is necessary before definitive conclusions can be reached on these topics.

The relationship between adolescents' school environments and their achievement motivation has also been documented in a few longitudinal studies. For instance, the type of learning goals emphasized in the school seems to have consequences for the learning goals endorsed by the students within those schools. Likewise, the particular teaching strategies used in the school – particularly the use of cooperative learning strategies – and the amount of adult support that adolescents feel they receive at school seem to have important implications for adolescents' achievement motivation.

School Engagement

Introduction

The third indicator, school engagement, refers to a student's level of "connectedness" to school (Connell, Spencer, & Aber, 1994). The topic of school engagement is one that has often received attention by educators, parents, and policymakers, typically arising when discussing the issue of school dropout and delinquency. Yet, there is no clear consensus on what is meant by school engagement or how to identify it. Indeed, even within the research literature a wide variety of measures of school engagement can be found. For instance, one set of authors (Finn & Rock, 1997) suggests that there are three levels of behavioral school engagement of interest – with the first involving basic school attendance and completion of schoolwork, the second involving participation in class when requested by school officials (e.g., answering a question when called upon), and the third involving active participation (e.g., asking questions and doing extra work). Yet, even this distinction focuses solely on behavioral indicators of engagement, whereas other experts in the field have suggested that there are emotional indicators of engagement as well. For instance, some have suggested that factors such as how much students like school, how bored they feel in school, and how strongly they feel they belong in school can be important indicators of their school engagement (Connell et al., 1994).

Both the emotional and behavioral domains of school engagement have been found to predict students' educational outcomes, such as their achievement and attainment, and are therefore important indicators of students' educational well-being (Connell, Halpern-Felsher, Clifford, Crinchlow, & Usinger, 1995; Connell et al., 1994). The following review will consider studies focusing on either (or both) of these components. The review will include research examining school attendance, the performance of homework, affective components of school engagement or attachment, as well as studies that include a measure of engagement cutting across these domains. We turn now to a discussion of the individual-, family-, peer-, and school-level antecedents of school engagement, as well as a description of the intervention programs for youth that have been demonstrated to influence this educational indicator.

Antecedents

Individual

A rather large research literature exists focusing on the individual-level antecedents of adolescents' school engagement. These studies have examined a number of aspects of educational adjustment (e.g., academic self-concept and achievement motivation; grade retention; test scores; and prior educational risk; and adolescents' behavior outside of school). A number of studies have also looked at immutable characteristics of adolescents, such as sex and race or ethnicity, to see how those relate to levels of school engagement.

To date, a couple of studies have identified a relationship between adolescents' ***self-concept***, both academic and global, and their levels of school engagement. For instance, Murdock et al. (2000) found that 7th grade students holding higher academic self-concepts tended to exert higher levels of effort in 9th grade, as indicated by their frequency of doing homework, levels of school attendance, levels of participation at school, and effort in studying for exams. This relationship was identified in a sample of mostly Caucasian and African American students from the mid-Atlantic, and was found despite controlling for differences in students' achievement, relationships with peers and teachers, and perceptions of education in 7th grade. Likewise, a similar relationship has been identified between adolescents' global (not specifically academic) sense of competence and their level of emotional or affective school engagement in a sample of urban, African American junior high school students (Connell & Halpern-Felsher, 1997), although this relationship was found in a cross-sectional examination and therefore must be interpreted with caution.

Further, a couple of studies have found a link between adolescents' ***attributions for academic success and self-regulation*** (two important components of achievement motivation) and their levels of school engagement. For instance, in a relatively large, diverse sample of high school students, Glasgow, Dornbusch, Troyer, Steinberg, and Ritter (1997) found that those who attributed school outcomes to causes other than their own effort reported being less involved and attentive at school and doing less homework at a later point in time than those who attributed school outcomes to their own behavior. This relationship remained even after controlling for differences across students in earlier levels of engagement, as well as characteristics of the adolescents' parents (education and parenting style) and adolescents' race, gender, and age. Wentzel (1997) found a similar link between students' sense of control over their academic outcomes and their level of effort in school in a smaller, less heterogeneous sample of junior high school students in the mid-Atlantic region. Finally, in a sample of urban, African American

girls in junior high school, Connell and Halpern-Felsher (1997) found that those with higher levels of self-regulation reported being more emotionally engaged in school that those with lower levels of self-regulation, even after controlling other academic and non-academic characteristics of the individuals. Although the engagement and self-regulation variables in this study were measured at the same point in time, the general pattern of findings supports those found in the two other longitudinal studies relating achievement motivation to school engagement.

Two other studies have suggested that there is a link between adolescents' ***feelings of connectedness with others at school and belonging at school*** (which itself is considered a form of school engagement) and their emotional school engagement. For instance, in a sample of African American and Caucasian 6th grade students in Michigan, Anderman (1999) found that students who reported greater feelings of school belonging and a greater desire to have friends at school expressed stronger positive affect toward school, including greater feelings of happiness, contentment, and excitement. This relationship held true even after controlling for differences in students' levels of affect, school grades, and demographic characteristics in 5th grade. Likewise, Connell and Halpern-Felsher (1997) found that urban, African American junior high school students who reported feeling more connected to themselves, their peers, and their teachers also reported greater emotional and behavioral engagement in school. Yet, these two measures were taken from a single point in time, hence these findings should be interpreted with caution.

Additionally, a handful of studies have documented an association between adolescents' grade retention history and their level of school engagement. For instance, two studies found links between adolescents' having been retained a grade level and their school engagement, although the studies report conflicting evidence regarding the direction of the relationship. Holmes and Matthews (1984) examined the relationship between ***grade retention*** and attitude toward school in 44 different studies. All of the studies examined compared a group of students who were retained in school to a comparison group of similarly at-risk students who were not retained. In summarizing the results of these studies, the authors concluded that there was a small, negative relationship between these two variables, with those having been retained in school showing slightly less positive attitudes toward school. Further, the authors also concluded that there was a similarly small, negative relationship between grade retention and attendance in the few studies examining this relationship specifically. That is, those who were retained had a poorer attendance record than those who were not. Yet, Gottfredson, Fink, & Graham (1994) found that, within a sample of urban middle-school students, students who were retained showed slightly higher levels of school attachment than would be expected given their levels of attachment prior to being retained. They argue that this higher level of attachment might results from adolescents' exposure to less advanced coursework, and therefore being more apt to succeed in it, or from increases in individuals' status among their classmates because of their older age. The differences in the conclusions from these two studies might have to do with student age, since the Holmes and Matthews analysis (1984) examined studies that also included elementary school students and do not look at differential effects by the age of the child. Alternatively, this discrepancy may point to the importance of the indicator of school engagement being examined. A number of studies have arrived at the same conclusion regarding a link between grade retention and lower levels of attendance (e.g., see Roderick, 1994), yet the evidence regarding other forms of school engagement seems to be more mixed.

A few other studies have documented a relationship between ***educational risk*** (as indicated by prior problems in adjustment to school), ***academic achievement,*** and ***academic track*** and school engagement. Connell and Halpern-Felsher (1997) found a relationship between higher levels of prior educational risk, as indicated by the degree to which students' had experienced low test scores, school suspensions, low attendance, course failures, and grade retention, and lower school engagement in a cross-sectional examination with a sample of urban, African American junior high school students. Further, a couple of studies examining two different national samples of adolescents have documented that adolescents receiving higher test scores in a variety of subjects reported higher levels of school engagement, including higher attendance and greater time spent on homework, at a later point in time (Berends, 1995; McNeal, 1999). Further, both Vanfossen, Jones, and Spade (1987) and Berends (1995) found less positive school engagement and higher truancy among those enrolled in a general track at school (and, at times, a vocational track as well) than those enrolled in an academic track.

A few studies have also identified links between adolescents' behavior outside of the school environment and their levels of school engagement. For instance, two studies examining national samples of adolescents have demonstrated that ***adolescents' engagement in problem behavior*** outside of school, as well as their disciplinary problems within school, are related to their emotional and behavioral school engagement (Berends, 1995; Liska & Reed, 1985). Further, a couple of studies have documented a relationship between the ***amount of employment*** adolescents undertake, and their subsequent levels of school engagement in national samples. For instance, in a national sample of adolescents who were examined over a two-year period, Mihalic and Elliott (1997) reported that adolescents who worked during both years of the study reported spending less time on schoolwork than those working only one of the years, who in turn spend less time on schoolwork than those working neither of the years. This relationship was identified even after controlling for important factors that might distinguish students who choose to work more years, such as their involvement in school activities, their families' economic circumstances, and their race, age, and gender. A second study found that the greater the number of hours adolescents are employed during their sophomore, junior, and senior years of high school, the less time they report spending on homework (Marsh, 1991a). Yet, it is important to note that not all longitudinal studies examining the relationship between adolescents' employment and school engagement found a negative relationship between these two variables. In fact, Steinberg and Avenevoli (1998) find little evidence of a link between the number of hours an adolescent works and his or her satisfaction with and feelings about school in a ethnically-diverse sample of adolescents from California and Wisconsin, once pre-existing levels of engagement are accounted for.

Finally, a number of studies have examined differences in adolescents' school engagement based on their ***sex and race or ethnicity***. A handful of studies have suggested that adolescent girls demonstrate higher levels of school engagement than boys. For instance, Finn and Rock (1997) reported that girls were more likely to work hard to do well in school, to be attentive and cooperative in school, and to come to class prepared than were boys in their sample of African American and Hispanic 10th graders. Likewise, both Berends (1995) and Anderman (1999) found that girls had a more positive affect toward school, on average, than boys in their ethnically-diverse samples. However, not all of the studies have found that girls had higher levels of average school engagement than boys. For instance, while Berends (1995) found that

girls had lower levels of truancy than boys in a national sample, Finn and Rock (1997) found that boys reported being more likely to attend class regularly. Hence, it is possible that sex differences in adolescents' school engagement might be somewhat dependent upon the specific aspect of engagement under consideration, with girls generally showing higher levels of affective engagement, higher attendance, and more effort in school, and boys being more likely to show regular attendance in classes[3].

In terms of differences by students' ***race or ethnicity***, the pattern is less clear across studies. A handful of studies have found that Hispanic students show higher levels of truancy or less regular class attendance than African Americans (Finn & Rock, 1997) and Caucasians (Berends, 1995; McNeal, 1999). Yet, some of these same studies found that Hispanic students reported doing more homework than African Americans (Finn & Rock, 1997) and both doing more homework and liking school more than Caucasians (Berends, 1995). Differences between African Americans and Caucasians have generally favored African Americans, with studies indicating that Black students showed greater attention to and involvement in school (Glasgow et al., 1997[4]), stronger positive affect toward school (Anderman, 1999), and less truancy (McNeal, 1999). Of the two studies comparing Asian American and Caucasian adolescents, one study found a higher level of attention to and involvement in school among Asian Americans (Glasgow et al., 1997), while the other found no differences in Asian American and Caucasian adolescents' truancy rates (McNeal, 1999).

In summary, a number of individual characteristics have been linked to adolescents' school engagement. Studies suggest that higher levels of academic and global self-concept are related to higher school engagement, as are more positive forms of achievement motivation. Greater feelings at belonging and connectedness at school are also linked to greater levels of engagement in school. The evidence for grade retention seems to be mixed, with one study suggesting that grade retention is related to higher levels of engagement while another suggests it is related to lower school engagement. These discrepancies might result from differences in the particular measures of school engagement used in these studies or the time in which the studies were conducted. Academic adjustment and academic track are both related to higher school engagement, as is lower levels of delinquent behavior and lower levels of employment, although the latter finding has received mixed support. The links between gender and adolescents' school engagement have also received mixed support – with some studies suggesting girls have higher levels of engagement, and other suggesting lower levels, than boys. There is also mixed evidence of differential levels of school engagement by race or ethnicity. It is quite possible that the evidence on these factors is mixed as a result of the great variation in definitions of school engagement across studies. Hence, future research is needed before the direction of these relationships can be ascertained.

---

[3] It is important to note the subtle difference between school attendance/truancy and regular class attendance. It is possible for a student to be present at school and yet still show irregular class attendance, either by skipping a specific class or finding excuses to be out of class (e.g., going to the school nurse, participating in sports or activities that require missing class or leaving class early).

[4] The relationships between race/ethnicity and school engagement identified in Glasgow et al. (1997) were indirect, occurring through the lower likelihood that Blacks and Asian Americans believed that their educational outcomes resulted from a cause other than their own behavior.

Family

In addition to the individual-level characteristics, a number of studies have identified a relationship between adolescents' family experiences and their levels of school engagement. These studies have generally concentrated on demographic characteristics of the family, such as its economic circumstances and its structure, as well as the interactions between adolescents and the key adults in their families.

Perhaps the most widely identified family-level predictor of adolescents' school engagement is their families' ***socioeconomic status*** (SES). For instance, Finn and Voelkl (1993) found that adolescents from families with higher socioeconomic status had lower levels of absenteeism and tardiness (as reported by both themselves and their teachers), were more likely to complete their homework and pay attention in class, were more likely to come to class prepared, and were less likely to have their parents called by their teachers about their attendance. This relationship was identified in a racially-diverse sample of over 6000 at-risk students from low socioeconomic or rural communities, and was found after controlling for adolescents' race, gender, and the structure of their school environment. Likewise, in a national study of adolescents, Berends (1995) found that students whose families had a higher socioeconomic status showed higher levels of school engagement, as evidenced by their reports of how much they liked school and how much time they spent on homework. Further, in an ethnically diverse sample of adolescents, Glasgow et al. (1997) found that adolescents whose parents had higher levels of education reported doing more homework than their peers whose parents had lower levels of education, even after controlling for other key variables related to parental education. Yet, not all studies have suggested that higher levels of SES are related to higher levels of all forms of school engagement. For instance, Berends (1995) found that students from higher socioeconomic status families reported higher levels of truancy than those from lower SES families. Further, Connell and Halpern-Felsher (1997) found an indirect negative relationship between family socioeconomic status and adolescents' school engagement in a cross-sectional analysis using a sample of African American junior high school students. This relationship appeared to result from higher levels of adult support at school that were associated with lower family socioeconomic status, and which in turn related to higher levels of school engagement. It is important to point out that this latter relationship was indirect and does not necessarily indicate that higher levels of SES are related to lower school engagement for boys on balance. Rather, it indicates that one pathway through which SES can affect boys' school engagement is through adult support at school, and in this case lower SES is related to receiving greater adult support at school. Further, for girls in this sample, the authors also found a positive indirect relationship between SES and school engagement, with lower SES relating to lower adult support in the home environment which in turn related to lower school engagement a year later. Hence, while a number of studies have identified a link between family socioeconomic status and adolescents' school engagement, the nature of this relationship is still quite unclear and needs further examination in longitudinal research.

A couple of studies have documented a relationship between ***family structure*** and adolescents' school engagement. For instance, examining a national sample of adolescents, McNeal (1999) found that adolescents in single-headed households in 8th grade were more likely to be truant in 10th grade than those in two-parent households, even after controlling for important correlates of family structure, such as the adolescent's race, the family's SES, and the level of parental monitoring and involvement in school. This finding is replicated in a second

national sample by McLanahan and Sandefur (1994), who also found that adolescents from one-parent families showed lower levels of attendance than those from two-parent families in a national study after controlling important factors related to family structure.

A single study has documented a relationship between the ***age of an adolescent's mother at her first birth*** and the adolescent's levels of school engagement. Examining a national sample, Levine, Pollack, and Comfort (2001) found that adolescents whose mothers gave birth to their first child under the age of 20 were more likely to be truant than adolescents whose mother gave birth to their first child at a later age. This relationship was found even after controlling for key variables that might distinguish between mothers who give birth to their first child at earlier and later ages, such as the mother's level of education, household structure while growing up, and level of intelligence. Yet, this study did not control for other important characteristics that might be related to the age at which an adolescent's mother first gave birth and adolescents' educational adjustment, such as parenting quality. Clearly, more research is needed to determine whether Levine et al.'s (2001) finding is found in different samples and using different methodology.

The level of ***parents' involvement and interest in adolescents' schooling*** also appears to have an important influence on Black male adolescents' school engagement. A number of facets of these interactions have been identified as important in the literature. For example, in a national sample of adolescents, McNeal (1999) has found that greater levels of communication between adolescents and parents about school were related to higher levels of satisfaction with and a more positive affect toward school for Black males. McNeal (1999) also found that adolescents who report greater communication with their parents about school and those whose parents reported greater involvement in parent-teacher organizations were less likely to be truant than adolescents with parents who were less involved in their schooling. Similarly, in a cross-sectional analysis, Connell and Halpern-Felsher (1997) found that higher levels of adult support at home, including the communication of concern or interest about the adolescent's schooling, were related to higher levels of behavioral and emotional school engagement for African American boys in junior high school[5]. Yet, not all forms of parental involvement in school may be beneficial for adolescents' school engagement. McNeal (1999) found that certain types of parental involvement in school, in particular greater contact with teachers and class visitation, were related to higher levels of truancy in adolescents. The author suggests that this finding might indicate parental reactivity, in which parents whose adolescents are behaving poorly are more apt to speak to teachers and get involved in their schooling, rather than a causal relationship between parental involvement and truancy. Although McNeal (1999) did not control for prior levels of truancy in his models, he did control for prior levels of academic achievement and school functioning. However, it is possible that these controls did not sufficiently address the issue of causality in his models.

Additionally, the nature of parent-adolescent interactions more generally may be an important predictor of adolescents' school engagement. Glasgow et al. (1997) found that adolescents whose descriptions of their parents suggested that the parents used a neglectful,

---

[5] This relationship between adult support at home and school engagement appeared to occur largely through increases in boys' feelings of competence and relatedness to themselves and others that were related to higher levels of adult support at home.

indulgent or authoritarian (providing supervision and discipline without acceptance of the adolescent and involvement in the adolescent's life) ***parenting style*** had lower levels of school engagement and did less homework than adolescents who described their parents' behavior in ways that indicated that they used an authoritative (providing supervision and discipline while also being accepting and involved) parenting style. These results occurred despite controls for parental education, adolescents' race, gender, and age, and adolescents' prior levels of homework completion and school engagement.

Peers

A single study has documented an association between ***peers' educational aspirations*** and adolescents' levels of school engagement. Murdock et al., (2000) found that adolescents who perceived their 7th grade peers as having higher levels of educational aspirations tended to demonstrate higher levels of academic effort in 9th grade, including greater frequency of doing homework and attending school, than those who perceived their peer as having lower levels of educational aspirations. This study examined a sample of 238 mostly African American and Caucasian students in the mid-Atlantic region, and included controls for adolescents' levels of achievement and self-concept in 7th grade, as well as key variables indicating relationships with teachers in 7th grade. The authors did not examine the actual aspirations of the youth's peers, but rather their perceptions of their peers' aspirations, hence it is difficult to tell for certain whether this finding is truly an effect of having peers with higher aspirations. Further research is necessary to replicate the findings of this study, as well as to determine whether a similar relationship is found when assessing the aspirations of adolescents' peers directly, rather than adolescents' perceptions of their peers' aspirations.

Neighborhood/Community/School

Numerous studies have examined how certain characteristics of adolescents' schools relate to their levels of school engagement. These studies have focused on broad characteristics of the schools, such as: the number of students and the demographic composition of the student-body; adolescents' perceptions of their teachers; and adolescents' perceptions of the goals that are emphasized by the school.

In terms of the demographic make-up of the schools, one study has suggested that the ***total student enrollment*** at at-risk adolescents' schools has implications for their school engagement. In a sample of at-risk 8th graders from low-SES or rural communities, Finn and Voelkl (1993) found that adolescents from schools with greater enrollment had a greater likelihood of being absent or tardy, lower teacher reports of their engagement at school, lower self-reported attendance, and lower self-reported preparation for class than students from smaller schools. It is important to note that this study is cross-sectional and therefore causality cannot be determined. Yet, the authors include in their analysis an array of variables that might be related to the types of schools students attend to attempt to minimize any pre-existing differences in students who attend larger or smaller schools, such as family SES, the adolescent's race, and the percentage of students and faculty who are African American. This same study finds a link between the ***percentage of students in a minority racial or ethnic group*** in adolescents' schools and their levels of school engagement, finding that students from schools with a higher proportion of minority students show higher levels of absenteeism and tardiness, lower engagement as reported by their teachers, and lower self-reported attendance (Finn & Voelkl,

1993). Again, it is important to read these findings with a cautious eye, since the study is cross-sectional in design.

In addition to the enrollment and racial/ethnic make-up of the school, the findings from a second study imply that the level of ***emphasis on academics*** in a school has important implications for adolescents' school engagement. Phillips (1997) found that adolescents attending schools that have a more "academic" climate in 7th grade (as indicated by teachers' perceptions of how many students expect to go to college and how much homework students do, as well as how many students are enrolled in pre-Algebra in 7th grade) have higher levels of attendance in 8th grade than students enrolled in schools with a less academic climate. This study examined a large sample of primarily African American students in a suburban area of the eastern U.S. The analysis controlled for 7th grade levels of attendance, as well as other indicators of 7th grade educational adjustment and school-level variables, such as the average SES of students' families in the school.

Adolescents' perceptions of the ***learning goals emphasized at school*** have also been found to relate to their levels of school engagement. Anderman (1999) found that, within a sample of mostly Black and White students from Michigan, students who perceived their 6th grade classrooms as placing greater emphasis on mastery goals had higher levels of positive affect and lower levels of negative affect toward school that year than those who perceived their classrooms as placing less emphasis on mastery goals. Further, students who perceived their classrooms as placing greater emphasis on performance goals expressed higher levels of negative affect toward school. This relationship was found even in the presence of controls for prior levels of affect toward school and other important variables.

Further, three studies have emphasized the importance of ***teachers' educational support*** for adolescents' school engagement. For instance, in a sample of mostly African American and Caucasian students in the mid-Atlantic, Murdock et al., (2000) found that students who perceived their teachers as having greater expectations for their academic success in 7th grade tended to show higher levels of effort in 9th grade than those perceiving their teachers as having lower expectations for their academic success. This relationship held even with controls for 7th grade achievement, academic self-concept, and other important variables. Further, in a study of mostly White students in the mid-Atlantic, Wentzel (1997) found that students who reported that the teachers in their school cared about them and how well they did in school in 8th grade reported higher levels of academic effort, even controlling their prior levels of academic effort and achievement. Finally, Connell and Halpern-Felsher (1997) found an indirect relationship between the adult support adolescents' received at school and their levels of school engagement[6]. Yet, this latter analysis involved cross-sectional data and ought to be interpreted with caution. Yet, taken together these studies suggest that teachers' support of students is related to their later educational engagement. It is important to note, however, that some studies have suggested this relationship is reciprocal in nature, with teachers being more supportive of students who show higher levels of engagement, thereby further increasing their levels of engagement (Skinner & Belmont, 1993).

---

[6] This relationship between adult support at school and school engagement was indirect, with higher adult support at school relating to higher feelings of competence for both boys and girls and higher feelings of autonomy and relatedness for girls, which in turn related to higher school engagement.

Societal/Policy

One study documented the relationship between school engagement and a school district reform effort. Wahlstrom, Davison, Choi, and Ross (2001) find that school start time is related to increased sleeping hours and modest increases in school attendance among high school students in Minneapolis, MN. Attendance data was collected from 1995-1996, when students began classes at 7:15 a.m., was compared to data from 1997-2000 when school began at 8:40 a.m. The School Sleep Habits Survey was conducted on 50,962 students enrolled in grades 9-12. More rigorous research examining this relationship is needed.

Programs that have been demonstrated to affect school engagement

A single study was identified that found a relationship between a ***family-oriented, substance-abuse prevention program*** and adolescents' school engagement. Abbey, Pilgrim, Hendrickson, and Buresh (2000) found that participation in a program aimed at reducing substance abuse by increasing teens' attachment to their school, peers, and families (the "Families in Action" program), was related to higher levels of school attachment. The findings from this study should be treated cautiously – participation in the program was voluntary, with those not volunteering to participate enrolled in the comparison group, resulting in differences in the treatment and comparison groups before the start of the program. Further, the sample of families participating in the program was small and the overall sample for the study was rather privileged (e.g., the majority of the parents had completed college). Yet, this study provides preliminary evidence that family-level intervention programs for the prevention of substance abuse can affect adolescents' levels of school engagement. Likewise, a non-experimental evaluation of the ***Seattle Social Development Program*** demonstrated that enrollment in this program, aimed at preventing adolescent health-risk behaviors through increasing bonds between families and schools, was related to high levels of school engagement in adolescence (age 18) in an ethnically-diverse sample of public school students from Seattle neighborhoods with high crime rates (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999).

. The program involved a classroom component, in which teachers were trained in proactive classroom management, interactive teaching, and cooperative learning and a family component, which provided parent training to foster parental monitoring, parental expectation, and parents' use of positive reinforcement and discipline. Students received the program during the first through fifth grades.

A second study documented a link between participation in a high school with a ***career academy approach*** (also known as "small learning communities"), a type of school-to-work program, and students' attendance rates among a group of students who were considered to be at high risk of dropping out of high school at the start of the study (Kemple & Snipes, 2000). The evaluation was experimental in design, meaning that individuals were chosen at random to either be eligible to enroll in the career academies or to participate in a control group, who could not enroll in the academies but could enroll in other schools if desired. Eligibility to participate in the career academy was related to an increase in average attendance of about eleven days of school per year across the high school years. Further, reviews of the experimental and non-experimental literature on multiple *school-to-work* initiatives (including the career academies),

which attempt to foster greater links between students' academic and career preparation, suggests that this approach is related to higher levels of student attendance (Hughes, Bailey, & Mechur, 2001; Jekielek, Cochran, & Hair, 2001).

Further, a number of rigorous evaluation studies have documented a relationship between at-risk adolescents' participation in ***mentoring programs*** and their levels of school attendance. Evaluations of four different mentoring programs, three of which focused solely on adolescents (with the fourth including elementary-school aged children as well), have documented higher attendance rates among students enrolled in a mentoring program than those not enrolled (Aseltine, Dupre, & Lamlein, 2000; Cave, George, & Quint, 1990; Losciuto, Rajala, Townsend, & Taylor, 1996; McPartland, & Nettles, 1991; Rhodes, Grossman, & Reche, 1999; for a review, see Jekielek, Moore, & Hair, 2001). Evaluations of one of these programs also documented an increase in attitudes toward school among those participating in the program as compared to those not participating (Aseltine, Dupre, & Lamlein, 2000; Losciuto, Rajala, Townsend, & Taylor, 1996).

Finally, a single experimental study of an ***educational enhancement program*** for at-risk 6th graders (the Boys and Girls Clubs of America) suggested that participation in this program was related to increased attendance (Schinke, Cole, & Poulin, 2000; as summarized in Redd, Hair, Moore, & Cochran, 2001). The authors of this study found that students participating in this program had higher attendance records than students in a comparison group who did not participate in the program.

Summary

In sum, adolescents' emotional and behavioral school engagement can have important implications for their later educational achievement and attainment and is therefore an important component of adolescents' educational adjustment.

A large body of research has documented important aspects of adolescents' lives that seem to have implications for their school engagement. For instance, their feelings about their competence, both broadly and within the academic realm, and their achievement motivation in school seem to be important predictors of their level of engagement in school. Likewise, their prior academic experiences, including being retained a grade (or held back a grade, whichever sounds better) and experiencing academic troubles more broadly, as well as their academic achievement and academic track all seem to predict their levels of engagement in school. Further, specific features of their feelings about school, such as their sense of belonging or their level of interest in making friends, can have implications for their school engagement, as can their behavior outside of the school context, such as their involvement in delinquent activity of their levels of employment. Finally, key differences between adolescents' school engagement based on their sex and/or their race or ethnicity have also been identified.

The predictors of school engagement expand past the individual level to include their adolescents' experiences with their family and their peers. A number of studies have documented the implications of adolescents' family characteristics for their school engagement, citing the importance of family socioeconomic status, structure, and the age at which an

adolescent's mother first gave birth. Further, interactions between adolescents and their parents, both regarding education as well as more generally, have been demonstrated to predict their levels of school engagement. Finally, though few longitudinal studies have examined the implications of adolescents' peer networks for their school engagement, one study documented a relationship between adolescents' perceptions of their peers' educational aspirations and their own levels of school engagement.

Finally, several studies have found links between the characteristics of adolescents' school environments and their participation in prevention programs and their school engagement. For instance, studies have suggested that the number of students enrolled in an adolescent's school and the proportion of the school that is in a minority ethnic or racial group can be important for their school engagement. Likewise, the degree to which the school emphasizes academics, the types of learning goals emphasized by the school, and the adolescents' perceptions of support from their teachers can also be important predictors of their school engagement. There is also preliminary evidence that having a school curriculum-based external exit examination can have implications for adolescents' school engagement. In terms of programs affecting adolescents' engagement, there is evidence that students' participation in a family-based substance abuse prevention program can affect their school engagement. There is also strong evidence that participation in a career academy can relate to school engagement among those most at risk of dropping out of high school, and that mentoring programs can affect school engagement among at-risk adolescents. Finally, there is evidence that participation an educational enhancement program for at-risk 6th graders can affect students' attendance at school.

While a number of antecedents have been identified in this literature, there is still a great need for more research. The majority of the antecedents have been document in only a single study or a handful of studies. Further, most of the studies were correlational in design, suggesting even greater need to replicate the findings, since these studies do not allow researchers to determine for certain whether the relationships found are causal in nature. Hence, while we have some preliminary evidence on a variety of factors in adolescents' lives that may have important influences on their school engagement, more research is most definitely needed.

Educational Aspirations and Expectations

Introduction

The fourth and final set of indicators in this section is students' educational aspirations and expectations. Adolescents' aspirations for their educational attainment – how much they hope or aspire to attain – and their expectations for their attainment – how much they actually expect to attain – can be important indicators of their level of adjustment in the educational arena. They provide indications of the level of importance that adolescents place on education and the degree to which they expect to continue their education into the future. Both educational attainment and educational expectations have been demonstrated to be important predictors of future educational attainment (Borus & Carpenter, 1984), and therefore might be considered important indicators of educational adjustment.

Antecedents

Individual

As was true for the other three psychological indicators of educational functioning described above, studies have documented a variety of individual-level factors that predict adolescents' educational aspirations and expectations. These include the constructs described above, such as academic self-concept and school engagement; indicators of academic achievement, such as grades and test scores; other indicators of academic adjustment, such as grade retention and disciplinary problems in school; as well as adolescents' engagement in behaviors outside of the school context.

Studies have documented relationships between ***academic self-concept, school engagement,*** and adolescents' educational aspirations and/or expectations. For instance, in their sample of mostly African American and Caucasian students in the mid-Atlantic, Murdock et al. (2000) reported that those with higher academic self-concepts in 7th grade reported higher expectations of going to college in 9th grade than those with lower academic self-concepts, even controlling for their prior academic experiences. Likewise, Berends (1995) noted that, within a national sample of high school students, those with higher levels of school engagement in 10th grade had higher expectations of attending college in 12th grade than those with lower levels of school engagement. This result remained despite controls for earlier college expectations, as well as other important characteristics of the adolescents' and their environments. Further, Murdock et al. (2000) found a relationship between ***perceived economic limitations to education*** and school engagement in a sample of mostly African American and Caucasian students, reporting that those perceiving fewer economic limitations to education in 7th grade reported having higher expectations of attending college in 9th grade than those perceiving greater economic limitations to education.

Further, a relationship has been documented between broader psychological adjustment, not just that within the school arena, and adolescents' educational aspirations and expectations. For instance, Trusty and Harris (1999) examined a national sample of 8th graders, all of whom expected to attend college at the start of the study. They found that girls in their sample who held a more external ***locus of control*** (i.e., felt that more things in their lives were outside their own control) were more likely to have decreased educational expectations between 8th grade and 2 years out of high school than girls with a more internal locus of control.

Other indicators of educational adjustment have also been found to relate to adolescents' educational aspirations and expectations. A number of studies report that those with higher ***test scores*** tend to hold higher educational expectations. For instance, Goyette and Xie (1999) reported that those performing better on a set of reading, math, and science tests in 8th grade expected to complete a greater number of years of schooling, and were more likely to expect to complete college, in 10th grade than those with lower test scores. This relationship was documented in this national sample of Asian American and White adolescents and one other study examining a national sample of students (Berends, 1995), as well as in a smaller sample of junior high/middle school students (Murdock et al., 2000). Additionally indicators of ***school disciplinary problems*** and ***grade retention*** have been demonstrated to relate to adolescents' educational aspirations and expectations. For instance, examining a national sample of high school students, Berends (1995) found that students who have higher levels of disciplinary

problems in 10th grade reported lower educational expectations in 12th grade than those with lower levels of disciplinary problems. Additionally, in another study using a national sample of students, Goyette and Xie (1999) found that Asian American and White students who had been held back as of 10th grade expected to complete fewer years of education, and were less likely to expect to complete college, in 12th grade than those who had not been held back. Finally, two studies examining a national survey of high school students suggest that adolescents' enrollment in an ***academic track in school*** is related to educational expectations, with those enrolled in the academic track having moderately higher levels of educational aspirations (Vanfossen, Jones, & Spade, 1987) and higher expectations of going to college (Berends, 1995) than those in the general track, though this latter relationship was rather small in size.

Adolescents' behavior outside of the school arena also seems to have implications for their educational aspirations and expectations. Two studies have documented a link between the ***amount of employment*** adolescents engage in and their educational aspirations. Mihalic and Elliott (1997) reported that students who worked two years in a row in their teen years reported lower levels of educational aspirations than those who worked only one year, who in turn reported lower levels of educational aspirations than those who worked only a single year. This relationship was documented in a national sample of adolescents, including key variables in the analysis that might differentiate between those working more or fewer years, including their earlier educational aspirations. Later analyses in this study suggested that the link between employment and aspirations was only true for non-white adolescents (but not whites) and for girls (but not boys). Marsh (1991) found a similar relationship between employment and aspirations in another analysis of a national sample of adolescents. The author of this study (1991) found that adolescents who worked a greater number of hours in their senior year reported having lower educational aspirations than adolescents who worked fewer hours that year. This relationship held up despite a wide range of controls for the adolescents' educational experiences, and other individual- and family-level characteristics.

Family

A number of characteristics of adolescents' family lives appear to have implications for their educational aspirations and expectations. The majority of these variables relate to the structure and demographic characteristics of the family – such as how many siblings the adolescent has or the family's socioeconomic status – others focus on parent-adolescent interactions.

Family socioeconomic status has been found to relate to adolescents' educational expectations in at least three studies, with higher levels of SES relating to higher educational expectations in each of the studies. For instance, in two studies based on national samples of students, adolescents from families with higher SES expected to complete a greater number of years of schooling and were more likely to expect to attend college than those from families with lower SES (Berends, 1995; Goyette & Xie, 1999). Although the Goyette and Xie (1999) sample was limited to students who were Asian American or White, the Berends (1995) study found a similar relationship in a sample of students from various racial and ethnic groups. Further, both of these studies included fairly extensive controls for other variables that might account for this relationship, including adolescents' earlier educational expectations. In a third study examining a national sample of eighth graders, adolescents whose families had a higher SES were less likely to decrease their educational expectations between eighth grade, when they all expected to

attend college, and two years out of high school than adolescents from lower SES families (Trusty & Harris, 1999).

Other studies have documented a link between the level of education adolescents' parents have received and the adolescents' educational expectations or aspirations. For instance, Glasgow et al. (1997) found that higher levels of ***parental education*** were related to higher adolescent educational expectations in an ethnically diverse sample. This relationship was found even controlling for prior expectations and other important variables. This finding was replicated in national sample of Asian American and White students, for both mothers' and fathers' education levels, although only having a father who was a college graduate predicted a greater likelihood of expecting to attend college (Goyette & Xie, 1999).

Characteristics of the structure of adolescents' families have also been found to relate to their educational aspirations and achievement. For instance, a couple of studies have documented a link between living in a ***single parent household*** and educational expectations or aspirations, particularly the expectation of attending college. Goyette and Xie (1999) found that Asian American and White adolescents from intact families were more likely to expect to go to college than adolescents from non-intact families, though they did not expect to complete a greater number of years of schooling. Likewise, McLanahan and Sandefur (1994) found that adolescents from single-parent families were less likely to expect to attend college than those from two-parent families. Both of these studies were based on national samples and controlled for a number of key variables that could be related to the likelihood that adolescents live in single parent families and/or their educational expectations. Yet it is important to note that neither of these studies controls for adolescents' earlier expectations, a variable that was found to eliminate the difference in educational expectations between adolescents whose parents experienced a marital disruption and those whose parents did not (Sun, 2001).

Two additional characteristics of adolescents' families, the ***number of siblings*** adolescents have and the number of generations of family members that have been born in the United States, have also been shown to predict adolescents' educational expectations. Goyette and Xie (1999) found that Asian American and White adolescents who had fewer siblings expected to complete a greater number of years of schooling and were more likely to expect to attend college than adolescents with fewer siblings. Further, the authors of this study found that adolescents who were among the first ***generation*** to be born in the United States expected to complete a greater number of years of education than those in the second or third generation, though they were not more likely to expect to attend college. This study was based on a national sample of Asian American and White students and included a myriad of variables to control for differences related to the number of siblings an adolescent has and his or her generational status that could make it difficult to determine whether the relationship between these variables and educational expectations is causal in nature.

Finally, a number of studies have demonstrated that the nature of parent-adolescent interactions can affect adolescents' educational expectations. For instance, Glasgow et al. (1997) found that adolescents who described their parents' interactions with them in such a way that would indicate they have a neglectful ***parenting style*** (neither showing acceptance and involvement, nor providing supervision or being strict with him or her) held lower educational expectations than their peers whose descriptions of their parents indicated that they used an

authoritative parenting style (showing both acceptance of the child and involvement in his or her life, as well as providing supervision and being strict with him or her). Further, in two studies ***parental involvement in school*** was demonstrated to predict adolescents' educational expectations (Trusty, 1999; Trusty & Harris, 1999). For example, Trusty (1999) found that higher levels of parental involvement in school organizations, such as involvement in parent-teacher organizations, and involvement in discussions about the adolescents' education at home in 8th grade were related to higher adolescent expectations that they would complete a bachelor's degree six years later. Likewise, Trusty and Harris (1999) found that boys from families in which parents were more involved in their education in 8th grade were less likely to have experienced declines in their expectations of attending college six years later. Finally, Goyette and Xie (1999) found that Asian American and White adolescents with higher ***parental expectations*** for their education in the eighth grade expected to complete a greater number of years of schooling and were more likely to expect to finish college in 12th grade. All three of these studies were based on national samples of adolescents and controlled for a number of key factors related to parental involvement and adolescents' educational expectations.

Peers

Only a single study was identified that reported a link between adolescents' peer networks and their educational expectations and aspirations. Murdock et al. (2000) found that adolescents who perceived higher ***peer educational aspirations*** in 7th grade were more likely to expect to go to college in 9th grade then adolescents who perceived lower educational aspirations among their peers in 7th grade. This relationship was found in a small sample of mostly Caucasian and African American students from the mid-Atlantic, in a study that controlled for a number of educational variables in the seventh grade, including students' earlier educational aspirations.

Neighborhood/Community/School

A variety of aspects of adolescents' schools have been found to relate to their educational aspirations and expectations. A handful of studies have suggested the importance of structural characteristics of the school--such as whether it is a public school and its per-pupil expenditures--for this domain of educational adjustment. Further a handful of studies have suggested that adolescents' perceptions of the teachers they interact with have important implications for their educational aspirations and expectations.

A set of studies has documented some of the structural features of adolescents' school environments that have implications for their educational expectations and aspirations. For instance, Regnerus (2000) found that higher levels of ***per-pupil expenditures*** were related to higher educational expectations and that ***attending a school in a low-income neighborhood*** was related to lower educational expectations in a panel study of high school sophomores. These findings ought to be considered with caution since the study is cross-sectional in design, although the inclusion of a number of individual-, family-, and school-level variables that might be related to students' attendance at different types of schools helps increase our confidence in these findings to a degree. Further, Marsh (1991b) found that attending a school with a higher ***average level of student ability*** in 10th grade was related to lower educational expectations among 12th graders in a national survey. Marsh (1991b) attributed this relationship to the "big fish, little pond" effect described earlier in this section. Finally, one study provided evidence

that Asian American and White adolescents attending ***public schools*** may have lower educational expectations than those attending private schools. Goyette and Xie (1999) found that students who attended a public school in 10th grade expected to complete fewer years of education and were less likely to expect to attend college in 12th grade than those attending a private school during this period. This analysis controlled for key individual-, family-, and school-level variables, including students' earlier educational experiences, which might limit the ability to determine the true relationship between school type and expectations.

In addition to the important features of adolescents' school structure, one study has documented a potential link between adolescents' ***perceived teacher support for their education*** and their educational expectations and aspirations. In a sample of mostly Caucasian and African American students in a mid-Atlantic school, Murdock et al. (2000) found that students whose perceived that their teachers had higher levels of expectations for their school success and displayed lower levels of disrespect and criticism toward them in 7th grade were more likely to expect to go to college in 9th grade. This relationship was found even after the authors controlled for key variables that might influence teachers' expectations and displays of criticism and disrespect toward students, such as adolescents' prior levels of achievement, academic self-concept, and perceptions of limitations to schooling.

Programs that influence educational expectations and/or aspirations

A number of programs were identified as having effects on adolescents' educational expectations or aspirations. McWhirter, Rasheed, & Crothers (2000) examined two groups of mostly European American high school sophomores in an urban mid-Western school who elected to take both a ***career education class*** and a health education class in their sophomore year. The authors compared students who chose to take the career education class in the first semester and the health education class in the second semester to those who chose to take the two classes in the opposite order. They measured a number of dependent variables, including the students' educational expectations, at the beginning of the first semester, end of the first semester, and end of the second semester. The results found that those who took the career educational class during the first semester reported higher educational expectations at the end of the first semester, even accounting for differences in expectations at the start of the study - but these differences had disappeared by the end of the second semester. Further, there was no sign that those who took the career education class during the second semester showed higher educational expectations after completing that class. Hence, this study provides only very limited evidence that participation in a career education class might be temporarily related to students' educational expectations.

Additionally, an experimental evaluation of a ***youth employment program*** documented a link between enrollment in this type of program and educational expectations among economically disadvantaged high school students and out-of-school young adults. Farkas, Olson, Stromsdorfer, Sharpe, Skidmore, Smith, and Merrill (1984) found that adolescents enrolled in this program, which provided on-the-job training and summer employment as well as a number of other components, were more likely to report expecting to finish high by the time of the follow-up than those not enrolled in the program.

Two experimental evaluations have linked participation in ***programs aimed at fostering academic and social competencies*** among disadvantaged high school students with adolescents' educational expectations. Hahn (1994) found that disadvantaged 9th grade students enrolled in this program - which provided education-related activities, development activities, and service activities and offered adolescents stipends and bonuses for completing segments of the program - showed higher educational expectations in the 12th grade than members of the control group. Likewise, an experimental evaluation of a second program aimed at increasing the academic and personal development of disadvantaged high school students demonstrated a link between adolescents' participation in this program and their educational expectations. Myers & Schrim (1999) found that adolescents enrolled in 536 Upward Bound programs across the country – a program that provided academic instruction, tutoring and mentoring, counseling, career and college planning, as well as intensive instruction over the summer months – reported higher educational expectations at a later follow-up than those not enrolled in the program.

Finally, a quasi-experimental evaluation of ***service learning programs***, which tie school work with community service, found a link between participation in these programs and adolescents' educational expectations. Weiler, LaGoy, Crane, & Rovner (1988) reported that high school students who participated in service learning reported higher educational aspirations than those who did not in a sample of 15 classroom sites in rural, urban, and suburban California neighborhoods (see also Michelsen, Hair, Moore, & Zaff, 2001 for a review).

Summary

In sum, adolescents' expectations and aspirations for their educational attainment can have important implications for their current and future educational achievement and attainment.

Adolescents' educational expectations and aspirations can be affected by a variety of aspects of adolescents' experiences and feelings. Students' perceptions of their academic competence and their engagement in school can be important contributors to their educational expectations and aspirations. Likewise, their previous experiences in the academic arena, including their achievement, their academic track, whether they've been retained a grade, and their level of disciplinary problems, have all been demonstrated to predict their educational expectations and/or aspirations. Further, their feelings and experiences outside of the school arena, including the extent of the employment and their feelings of control over their lives seem to influence their educational expectations and aspirations.

Additionally, a number of characteristics of adolescents' family environment and peer networks have been demonstrated to relate to their educational aspirations and expectations. For instance, the socioeconomic status of adolescents' families, the level of education attained by their parents, and whether they have two parents living in the home have all been documented to have implications for adolescents' educational expectations and aspirations, as have the number of siblings adolescents have and the number of generations of family members that have been born in the United States. Further, the style with which adolescents' parents interact with them and the level of involvement and interest they show in their schooling seem to influence their educational expectations and aspirations. Finally, the degree to which adolescents perceive their peers as having high educational aspirations also seems to influence their own expectations and aspirations.

Studies have also documented the role that school environments can play in affecting adolescents' educational aspirations and expectations. For instance, the per-pupil expenditure of adolescents' schools and their location in a low-income neighborhood both seem to have implications for adolescents' expectations and aspirations, as do the average level of ability among the student-body and whether the school is public or private. Further, students' perceptions of their teachers interest in their education also seems to have implications for their expected and aspired educational attainment. There is also quite limited evidence that adolescents' participation in a career education class and more convincing evidence that enrollment in a youth employment program can each have an effect on adolescents' educational expectations. Finally, there is rather convincing evidence that at-risk adolescents' participation in programs aimed at fostering their academic and personal competence can affect their educational expectations, and evidence that participation in service learning programs can influence adolescents' educational aspirations.

Summary of antecedents of psychological indicators of educational adjustment

Given the substantial overlap in the literature on these four indicators of adolescents' psychological adjustment to school, an important question is which antecedents have been found to be important predictors of many or all of these four indicators. This information can be useful for those interested in targeting aspects of adolescents' lives that seem likely to provide the most "bang for the buck" in the sense that they are likely to increase adolescents' educational adjustment in multiple ways. Hence, the following section will discuss the major antecedents found to be important predictors of the four indicators discussed in detail above, paying particular attention to those antecedents at each level that have been identified in the research as predicting most or all of these four outcomes. However, it is important to note that the fact that a given antecedent has been found to predict only a single or couple of these four indicators does not necessarily indicate that it is at all unimportant. In fact, some antecedents may predict only a few indicators but predict them quite strongly (i.e., having "big" effects on adolescents' adjustment) whereas others might affect many indicators only weakly[7]. Likewise, the lack of a documented relationship between an antecedent and an indicator may be as much a statement of whether research has investigated the relationship as whether it has been found to be significant. Hence, while the following discussion can provide useful information on which antecedents have been found to predict multiple indicators of psychological adjustment to school, this information should be treated cautiously.

Individual-level antecedents

The only antecedent identified as an important predictor of all four psychological indicators of adolescents' education adjustment is adolescents' prior levels of academic achievement. While studies have differed in the measures of achievement used (e.g., grades, educational "risk, test scores), this variable has emerged as an important predictor of academic self-concept, achievement motivation, school engagement, and educational aspirations and expectations. In all cases, of course, higher levels of prior achievement are related to better

[7] Unfortunately, descriptions of the size of the relationships were rarely provided in the studies reviewed here, hence it is not possible to provide a discussion of which antecedents appear to have the strongest relationship with indicators of psychological adjustment to school.

functioning in these domains. Hence, preventing problems in achievement early on in an individual's life appears to have implications for most aspects of their later educational adjustment, at least for the psychological components of that adjustment.

Academic self-concept and levels of school engagement also seem to be fairly consistent predictors of adolescents' psychological adjustment to school. Research has suggested that higher levels of academic self-concept are related to more adaptive forms of achievement motivation, higher levels of school engagement, and greater educational aspirations and expectations. Likewise, having greater feelings of connectedness and belonging to school are related to holding more adaptive forms of achievement motivation and higher educational expectations and aspirations. These feelings are also important predictors of other types of engagement to school, such as levels of attendance. Hence, increases in academic self-concept and school engagement can have implications for adolescents' overall psychological adjustment to education.

Another variable found to relate to the majority of the indicators was adolescents' levels of employment. More intense employment during the adolescent years (including a working greater numbers of hours and working for a greater number of years during high school) has been found to relate to lower levels of academic self-concept, lower school engagement, and lower educational expectations and aspirations. Therefore, extraordinarily high levels of employment during the school years may have problematic implications for adolescents' psychological adjustment to school.

Finally, gender also seems to be an important predictor of adolescents' psychological adjustment to education. However, the relationship between gender and adjustment seems to vary by the type of indicator under consideration. For instance, girls have been found to have higher global and English self-concepts, but lower math self-concepts, than boys. Likewise, girls seem to show higher levels of most forms of school engagement than boys, but may be less likely to attend class regularly than boys as well. Only the gender differences in achievement motivation have been consistent across studies, with girls generally showing more adaptive forms of achievement motivation than boys.

Other individual variables were not as consistently identified in the research literature. For instance, adolescents' participation in the academic track at school and adolescents' involvement in problematic behavior (at school and outside of it) were both found to predict two of the four indicators discussed in this section. Further, perceived economic limitations, grade retention, locus of control interest in adhering to school rules and making friends at school, and achievement motivation were all identified as predictors of one indicator but not the others. Hence, each of these indicators might be influential for increasing the adolescents' levels of adjustment on one of these indicators, but may not necessarily be useful for influencing the others.

Family-level antecedents

In general, there were fewer studies focusing on family-level predictors of these four indicators than on individual-level predictors. As a result, fewer predictors emerged as important and there was less likelihood that a given antecedent would have been examined across all four

of the variables. Yet, certain patterns of predictors emerged as important for multiple aspects of adolescents' psychological adjustment to school.

Parental involvement in adolescents' schooling emerged as the most consistent predictor across studies of these four indicators. Increased levels of parental involvement predicted more adaptive forms of achievement motivation, higher levels of school engagement, and greater educational aspirations and expectations. However, one study found that the relationship between parental involvement and adjustment varies depending upon the type of involvement being considered, with increases in what adolescents perceive as increased support and interest in their schooling and in parents' involvement in parent-teacher organizations tending to predict better adjustment, whereas other forms of involvement (such as contacting teachers) not necessarily showing a positive relationship. More research is certainly needed to further investigate the possibility that some forms of parental involvement are not beneficial (and indeed may be harmful) and to more clearly delineate which forms of parental involvement are most beneficial for adolescent adjustment.

Other important variables have been demonstrated to predict two of the four indicators examined here. For instance, higher levels of socioeconomic status were generally related to higher levels of school engagement and higher educational aspirations and expectations than lower levels of socioeconomic status. Likewise, living in a two-parent family was found to predict more positive adjustment on these two variables than living in a single-parent family. Finally, adolescents who have a parent who is authoritative (supportive yet strict) in their parenting tend to have higher levels of school engagement and higher educational expectations than adolescents whose parents are neglectful, permissive, or authoritarian. Hence, while these antecedents have been documented as predictors of only two of the four indicators, they are potentially important characteristics of adolescents' family lives that ought to be considered when attempting to increase their educational adjustment.

Finally, a handful of antecedents were documented as predictive of one of the four indicators of adolescents' psychological adjustment to school. Child support from a non-residential father, growing up in a cognitively stimulating home environment, and levels of parental education were all found to predict a single outcome examined in this section. Likewise, being born to a mother who was a teenager at her first birth, living in a larger family, and having parents with lower educational expectations were each related to lower levels of adjustment on one of these variables.

Peer-level antecedents

The literature relating characteristics of adolescents' peer networks to their educational adjustment is by far the most scant of all of the levels examined here. Only a handful of studies have related peer-level factors to adolescents' psychological adjustment to school.

The literature that has examined this relationship has fairly consistently suggested that the educational functioning of adolescents' peers has implications for their own educational adjustment. For instance, adolescents whose peers had (or were perceived to have) higher educational aspirations tended to have higher levels of academic self-concept and school-engagement, and higher educational aspiration and expectations than adolescents whose peers had lower educational aspirations. Likewise, adolescents whose peers held more adaptive forms

of achievement motivation tended to hold more adaptive forms of motivation themselves than adolescents whose peers held less adaptive forms of achievement motivation. Hence, while more research on the relationship between adolescents' peer networks and their educational adjustment – at least their psychological indicators of educational adjustment – is badly needed before any firm conclusions can be drawn, there is certainly some evidence suggesting that adolescents whose peers are more educationally well-adjusted are themselves more likely to be educationally well-adjusted.

Neighborhood/Community/School-level

A number of studies have identified key characteristics of adolescents' school environments that are related to their psychological adjustment to school. These variables tend to relate to the composition of the school and adolescents' perceptions of the school environment, but also involve characteristics of the school's academic structure.

The most common predictors of adolescents' psychological adjustment to school at the school-level were the adolescents' perceptions of the support or interest that their teachers have in their education or their perceptions of their teachers' expectations for their educational achievement. Students who felt that their teachers were more supportive, interested, or held higher expectations for their future education had higher levels of school engagement, higher educational expectations for their own education, and were more likely to endorse positive forms of achievement motivation than students who saw their teachers as less supportive, interested, or optimistic about their futures. Hence, the degree to which adolescents' perceive their teachers as being interested in them and/or being hopeful for their futures seems to have implications for multiple aspects of their psychological adjustment to school.

Likewise, the average level of student achievement at an adolescent's school seems to be an important predictor of multiple aspects of his or her educational adjustment. Students attending schools with higher average levels of school achievement report lower levels of academic self-concept, less engagement to school, and lower educational expectations than students surrounded with lower achieving classmates. While this might suggest that there would be some benefit to placing students in lower achieving schools it is important to consider two key points: First, these negative implications pertain only to students' psychological adjustment to school, which - while important – should be considered in combination with the many other indicators of educational adjustment discussed later in this document. If attendance at a higher-achieving school lowers students' self-concepts or educational expectations but has positive or neutral implications for their academic achievement or educational adjustment, there may be no reason for concern over the relationship between average school achievement and adolescents' psychological adjustment to school. Second, if the negative relationship between average school achievement and adolescents' psychological adjustment to school is the result of the "big fish, little pond" effect above (the tendency for students' to feel less academically competent when surrounded by more competent peers), it may be just as effective to reduce adolescents' perceptions that their classmates are performing very well as it would be to move them to lower-achieving schools.

The goals that schools emphasize for adolescents' achievement also predict multiple components of their psychological adjustment to school. The emphasis of more adaptive goals for learning (e.g., goals of mastering the task vs. goals of performing well on tests) is related to

adolescents' endorsement of more adaptive forms of achievement motivation, as well as higher levels of school engagement.

Other antecedents, though perhaps no less important, have only been documented to predict one of the four indicators examined here. For example, the use of special classes for gifted and talented students seems to be related to lower levels of academic self-concept in students (a relationship that again speaks to the "big fish, little pond" effect and should be considered in combination with the implications of gifted and talented classes for student achievement). Likewise, studies have documented relationships between the use of tracking by schools, levels of school enrollment, per-pupil school expenditures, and the location of schools in low-income neighborhoods and one component of students' psychological adjustment to school.

Programs that have been documented to increase adolescents' psychological adjustment to school

A handful of studies have documented program initiatives that increase the four psychological indicators of adolescents' educational adjustment outlined in this section. These programs have ranged from school-based initiatives, such as service learning programs, to programs targeted toward adolescents' families.

Mentoring programs and academic enhancement programs seem to offer to greatest potential for influencing multiple aspects of adolescents' psychological adjustment to school. These programs have been found to increase adolescents' school engagement (though not always every form of engagement) and, to a lesser extent, adolescents' levels of academic self-concept. Likewise programs aimed at increasing the academic achievement (and at times the social adjustment) of at-risk youth have also been demonstrated to increase adolescents' school engagement, as well as their educational expectations. Programs such as the Upward Bound programs and the Boys and Girls Clubs of America have been demonstrated to improve adolescents' psychological adjustment to school in these domains.

Other types of programs have been identified as successful in increasing one, but not other, component of adolescents' psychological adjustment to school. For instance, counseling programs for middle school and high school students (and academic programs for middle school students) seem to increase the levels of academic self-concept in students with a learning disability. Likewise, cooperative learning strategies have been linked to increases in students' endorsement of positive forms of achievement motivation. Participation in "career academy" schools has been linked to higher levels of school engagement in at-risk youth, as has participation in a family-based program aimed at preventing substance abuse. Further, participation in a youth employment program and service learning is linked to higher educational expectations in adolescents.

ACADEMIC INDICATORS OF EDUCATIONAL WELL-BEING

We now turn to our second set of indicators of educational adjustment, academic achievement and educational attainment (which will each be covered independently in the following two sections). The indicators of academic achievement that we cover are test performance, school grades (grade point average), and grade failure or repetition. The educational attainment measures to be covered include high school completion or dropout, postsecondary school attendance and postsecondary school completion. We cover postsecondary school completion to a lesser extent than the other indicators because fewer studies have examined this as an outcome for individuals age 22 or younger.

Academic Achievement

Introduction

Academic achievement is an important indicator of adolescent adjustment for a number of reasons. Achievement is positively related to a number of psychological indicators of educational adjustment, such as school engagement, academic self-concept, and other indicators discussed in the previous section of this document. Students with higher levels of achievement during adolescence are more likely to complete high school, and to attend and complete college than their peers with lower levels of achievement (Cairns, Cairns, and Neckerman, 1989; Adelman, 1999). Further, high school test scores predict later success in the job market, such as higher wages (Blau and Kahn, 2000). Finally, lower levels of education and skills are associated with lower levels of economic success, including a greater likelihood of living in poverty and receiving government assistance (Gottschalk, McLanahan, & Sandefur, 1994; Boisjoly, Harris, & Duncan, 1998). In sum, adolescents' academic achievement is important as it promotes their later success in life; as this is the case, the following discussion of the various antecedents of academic achievement during the secondary school years will help us understand what leads to academic success during adolescence.

This section covers the many predictors of adolescents' academic achievement, as indicated by their school grades or their test scores. Although there are many other indicators of academic achievement that might be considered, such as class rank, or curricular rigor, we have chosen to focus on grades and test scores, the two most commonly studied indicators of achievement in this section. Since the research on academic achievement among middle school and high school students is quite expansive, this literature review is not exhaustive in its scope. However, by reviewing the major academic achievement studies for secondary school students, we are able to discuss most of the major predictors of adolescents' academic achievement that have been documented in the current research.

Antecedents

Individual

Research has identified a number of individual predictors of academic achievement, including academic ability, psychosocial factors, gender, race, out-of-school activities, and employment.

Most of the studies examined for this review include a measure of ***prior achievement*** as a predictor of later achievement. Although this variable was typically entered into the analysis to "control" for selection bias, all of the studies that included a measure of prior achievement found it to be a statistically significant predictor of later academic success. For instance, Jordan and Nettles (1999), in an analysis of data from the National Educational Longitudinal Study of 1988 (NELS), found that 10th grade reading achievement predicted math and science achievement in the 12th grade. This relationship was also documented by McNeal (1999) and Gamoran (1992), using data from High School and Beyond. Further, this relationship consistently held while controlling for other important background factors, such as family income, parental education, and race. Higher composite reading and math scores predict college attendance (Zaff, Moore, Papillo, & Williams, 2001).
One study found that earlier grades predicted later grades (Gutman & Eccles, 1999), while another found that reading and math test scores were the strongest predictors of later achievement scores (Gortmaker, Salter, Walker, & Dietz, 1990). In analyses of data from the National longitudinal Survey of Youth of 1979 (NLSY), adolescents' achievement test scores predicted their likelihood to graduate from high school (Ludwig, 1999; Mensch & Kandel, 1988).

Another study documented a link between adolescents' childhood IQ and their later academic achievement. Teo, Carlson, Mathieu, Egeland, and Sroufe (1996), examined the effect of ***IQ*** and other individual factors on achievement outcomes at age 11 and age 16. They found that, of all the variables examined, IQ was the strongest predictor of individuals' reading and math achievement in grade 6 and age 16. This relationship was found in a racially diverse sample of 174 urban youth from Minneapolis and was documented even after the authors' controlled for other key variables, such as individuals' socioemotional adjustment, early home environment, and maternal life stress.

A number of studies have found ***gender*** to predict academic achievement. Conger, Conger, and Elder (1997) found that males reported having significantly lower GPAs than did females in 10th grade after controlling for a number of background factors. The sample of 357 was created from a larger study of White lower- to middle-class families from rural Iowa who were followed from grades 7 to 10. In addition to evidence showing females having higher grades than boys, Smith (1990), in her analysis of a sample of 7th graders who were followed through the 9th grade, found that females' growth in verbal achievement, as measured by their language test performance, was greater than that of males. Similarly, Guo (1998), in an analysis of NLSY data, found that females scored higher than males on reading recognition and comprehension tests, after controlling for family background factors.

Conversely, other studies have found that females have lower levels of achievement, as indicated by test scores, in math than males. For instance, Jordan and Nettles (1999), in an analysis of data from the National Educational Longitudinal Study of 1988 (NELS), found that girls had lower scores on math and science tests in the 12th grade than boys. Additionally, Gamoran (1992) found girls scored lower on a test of math and verbal achievement. Likewise, Entwistle, Alexander, and Olson (1994) found that adolescent males outperformed adolescent females on the Math Concepts and Applications test, a subtest of the California Achievement Test focused on math reasoning. The sample included 279 Black and White students from Baltimore. Further, the difference in boys' and girls' performance was most severe among the

highest achieving youth. Among the relatively small samples of high achieving (31 boys and 38 girls), the average score for boys was 22.5 points higher than that for girls. Further, this difference was even stronger among African Americans, in which there was a greater gap between high-performing males' and females' test scores (Entswisle et al., 1994). This pattern held despite the fact that African American females were far more likely to be enrolled in algebra class (62 percent of females versus 33 percent of males).

Not all studies support this pattern. For instance, Entwisle et al, (1994) also found an opposite pattern among the low-performing youth, with girls outperforming boys within this subgroup. Also, Guo (1998), in an analysis of NLSY, found that males and females scores did not differ significantly on the math achievement tests, after controlling for a number of background factors.

Many studies included indications of adolescents' ***race or ethnic background*** in their examination of predictors of academic achievement. The majority of these studies consistently found that Black and Hispanic adolescents were more likely than Whites to have lower academic achievement performance, on average, in various subjects. For example, Guo (1998), in an analysis of NLSY, found that Blacks scored significantly lower than Whites on the achievement tests, after controlling for a number of background characteristics. McNeal (1999) found that Black and Hispanic adolescents had lower levels of science achievement than White adolescents, where as there was no difference in science achievement between Asian and White students. These relationships were found in a national sample after controlling for students' gender, SES, prior achievement, GPA, hours worked, hours of homework, history of grade repetition, and family structure. Further, support comes from Felgin (1995), who also found lower math and verbal achievement among Blacks and Hispanics than among Whites in a national sample. However, unlike McNeal (1999), Felgin (1995) did find a difference between Asian and White students, with Asian youth having higher levels of mathematics achievement than Whites. Lower levels of achievement among Blacks and Hispanics than among Whites were also documented in the Jordan and Nettles (1999) study and the Gamoran (1992) study noted above, both of which examined national samples of adolescent students. Further, although most of these studies found that differences in the SES, levels of parental education, and other experiences of adolescents from different groups accounted for much of the differences in achievement between racial and ethnic groups, these differences remained significant even after these controls were added.

Few studies included information on the many different nationalities or ethnic backgrounds within a given racial category as many surveys have not asked for such information and sample sizes are likely to be small. However, it is important to note that research has demonstrated that risk levels between ethnic groups and nationalities, even within a given race, are not equal. For example, research has shown that differences in educational outcomes are found to occur among Asians based on background differences, including nationality and whether they or their parents were born in the United States (Sui, 1996).

Guo (1998), in an analysis of NLSY, found that adolescents with higher birth weight had higher math achievement test scores than those who were born at lower birth weight.

Further, some studies have documented a relationship between individuals' psychosocial adjustment, both within and outside of the academic realm, and their academic achievement. For instance, Teo et al. (1996), in the study described above, found a relationship between individuals' cumulative ***socioemotional adjustment***, as measured by teacher ranking of children on their emotional health and peer competence in the 1st, 2nd, 3rd, and 6th grades, and their reading and math achievement in at age 16. Further, Jordan and Nettles (1999) found that 10th grade ***academic self-concept*** predicted math and science achievement in the 12th grade, after accounting for background factors.

In addition to individual characteristics, adolescents' individual choices, such as their use of time during nonschool hours, have been found to predict academic achievement. For example, some studies have found that adolescents who are involved in ***extracurricular activities*** have higher levels of achievement than those who are not. In an examination of a sample of 1,259 mostly White adolescents, Eccles and Barber (1999) found that adolescents' 10th grade participation in team sports, school leadership or school spirit activities, academic clubs, and performing arts were each independently related to having a higher 12th grade GPA, after controlling for students' gender, verbal and math ability, and parental education. Likewise, Jordan and Nettles (1999) examined the relationship between participation in various out-of-activities in grade 10 and achievement outcomes in math and science in grade 12 in a national sample. They found that adolescents who participate in greater levels of structured activities and adolescents who spend more time alone were both independently associated with higher levels of achievement in math and science in the 12th grade.

One study found that time spent doing chores was also significantly related to academic outcomes, as measured by language, reading, and mathematics scores. Smith (1992) analyzed a sample of 1,584 students in grades 7-11 in 14 public schools in a racially and economically diverse southeastern metropolitan county. He found that ***hours spent doing household chores*** was predictive of decreased growth in academic achievement over two years, with those spending more time on chores over the two year study period showing lower growth in achievement. Smith's analysis showed that time spent doing chores was more adverse for Whites than for Blacks. These findings held after controlling for race, gender, grade, family structure, parental education, and parental occupation.

Another potentially important determinant of adolescents' academic achievement is the amount of time they spend viewing and using different forms of media, especially ***watching television***. The types of programs that they watch may be important as well. Two longitudinal studies showed mixed evidence of the relationship between television viewing on academic achievement. Collins, Wright, Anderson, Huston, Schmitt, and McElroy (1997) examined the effects of television watching during early years on academic achievement in adolescence. Specifically, they looked at type and amount of television viewing at age 5 on achievement during high school. The sample was made up of 491 students (86% of original preschool sample) from White working class and middle class families who were re-interviewed at age 15. Net of controls, math grades and book use (reading) were predicted by the viewing of child-informative programming during preschool years. Viewing Sesame Street, a child-informative program, was predictive of book use, GPA, and science, math and English grades. For boys, child-informative television viewing during preschool years was predictive of grades in English, math, science, GPA, and book use. For girls, Sesame Street viewing and viewing of child

informative programming overall at age 5 was not predictive of grades, GPA, or book use. Adolescent boys who had viewed television programming that was not child-informative at age 5 did not have significantly lower test scores than boys who had not watched such programming.

In contrast, Gortmaker, Salter, Walker, and Dietz (1990), in a national sample of children who were followed up at ages 12-17, found no relationship between television viewing and reading and math scores. Although their cross-sectional findings showed that current television viewing was significantly and negatively related to reading and math test scores, after controlling for prior achievement, mother's and father's education and age, income, number of children in family, birth order, race, and parental restrictions, these findings became insignificant. Two studies using more recent data replicated this study with cross-sectional findings becoming insignificant when prior television viewing and test scores were considered (Smith, 1990; Smith 1992). Yet, Hargborg (1995), in a cross-sectional analysis of a semi-rural sample of 152 high school students, found no differences between light, medium, and heavy television viewers, after controlling for employment, gender, and SES.

Smith (1992) also found that adolescents who spend greater amounts of time ***listening to the radio or music recordings*** are more likely to have lower levels of growth in reading achievement between the 7th and 9th grades.

Employment, another common use of out-of-school time among adolescents, has been found to be predictive of academic achievement. A substantial number of studies have demonstrated a negative relationship between working over 20 hours per week and adolescents academic achievement. Steinberg and Cauffman (1995) reviewed several studies that examined the relationship between adolescent employment and their educational development. The authors found that ***work intensity*** was the most consistently predictive employment variable for educational outcomes among adolescents. Generally, they found that working over 20 hours per week was associated with diminished school performance, as measured by grades or school engagement variables (Steinberg & Cauffman, 1995). Likewise, Jordan and Nettles (1999), in using NELS data, found that the number of hours adolescents worked in the 10th grade was negatively associated with their math and science test scores in the 12th grade after accounting for their prior achievement, background factors, such as race, SES, and family structure, and school-level factors.

Singh (1998) also found a negative relationship between academic achievement and adolescent employment, with students working longer hours being more likely to have lower grades and achievement scores than adolescents working fewer hours. Similarly, in an analysis of High School and Beyond data on a sample of 10,613 for whom data were assessed for both 10th and 12th grades, Marsh (1991c) found hours of work in the 10th grade predicted lower academic achievement, as measured by placement in academic track, grades, and test scores in the 12th grade. These findings remained constant after controlling for background factors, such as race, gender, and SES. Oettinger (1999), in a cross-sectional analysis of a sample of 2,510 11th and 12th graders using data from the National Longitudinal Survey of Youth of 1979 (NLSY), found that working longer hours during high school seems to was related more strongly to lower grade point averages for minority students than for students in other racial and ethnic groups. These findings held after controlling for individual and background factors, including number of siblings, race, gender, maternal education, and AFQT score, and history of grade

repetition. However, one study found that working did not adversely affect grades. Warren, LePore, and Mare (2000), in an analysis of NELS data, found that preexisting differences between adolescents who work more and less intensely account fully for the relationship between work intensity and grades. With one exception, studies have consistently found that adolescents who work longer hours during the school year are more likely to have lower levels of achievement.

However, adolescents' ***employment during the summer months*** seems to have different implications for their achievement. For example, Oettinger, using cross-sectional data, found no relationship between adolescents' summer employment and their GPA. However, Marsh (1991b), in a longitudinal analysis, found that summer employment was related to higher levels of achievement, after controlling for school-year employment and background factors.

Adolescents' reasons for working may also be related to their academic achievement. Marsh also found that adolescents who reported that they ***work to save money for college*** had higher grades than those who did not report this as a reason for working (Marsh, 1991b).

In summary, adolescents' characteristics, including their race, gender, and level of cognitive and academic ability, predict much of their academic achievement outcomes. In addition to individual characteristics, their independent choices about their use of time outside of school also affect their academic achievement. Specifically time spent working, participating in extracurricular activities, doing household chores, and media use are all related to adolescents' achievement.

Family

A large number of family background variables have been documented as predictors of adolescents' academic achievement. These include indicators of families' ***socioeconomic status*** (SES), including their family income and parental education; their family structure, including both marital status and family size; as well as parents' levels of involvement and monitoring.

Family income and parental education were found to be important predictors of adolescents' grades and test scores. For instance, Conger, Conger, and Elder (1997) found that greater levels of ***family income*** were associated with higher GPA's in grade 10. Further, the findings indicated that adolescents' experiences with poverty here also predictive of their grades in school in this study. For instance, Conger, et al. (1997) found that adolescents who were poor during some point in the four year study period had lower GPA's in 10th grade than those who were not poor during any point of the study. More recent poverty was associated with 10th grade GPA. However, being in poverty early in the four year study or throughout the entire four year study period was not associated with 10th grade GPA. Having a higher family income was predictive of having a higher GPA. Income-to-needs ratios greater than three were also positively associated with GPA at grade 10. This means that children in families whose incomes were at least three times as great as the poverty line (averaged over the four years of the study) had higher levels of achievement. Additional longitudinal evidence on the importance of recent poverty on adolescent achievement was found by in a national data set with a racially diverse sample, the National Longitudinal Survey of Youth (NLSY) and NLSY child sample. Using a mixed linear model, Guo examined the influences of timing of poverty on adolescents' achievement outcomes for approximately 922 children were given reading recognition,

comprehension, and math tests between ages 5 and 8, and again when they were early adolescents, between the ages of 11 and 14. Early *poverty* was defined as being in poverty during the four years before turning six, and late *poverty* was defined as being in poverty during the four years prior to the early adolescent follow-up. Early *cumulative poverty* was defined as being in poverty during their first six years and the late *cumulative poverty* was defined as being in poverty throughout their life until the early adolescent follow-up. Other measures of income included income-to-needs ratio and total family income. Guo (1998) found that early cumulative poverty, late cumulative poverty, and late poverty predict lower scores on adolescents' achievement tests. Long-term average income-to-needs ratio and long-term family income also predicted lower achievement test scores. However, later poverty was found to be more detrimental to adolescent's achievement, predicting even lower scores, than childhood poverty. These findings remained after accounting for child characteristics and family background factors, including prior achievement, race, age, sex, maternal cognitive ability, maternal education, birth weight, birth order, number of siblings, maternal age, family structure, region, and urban residence.

A number of studies have found that parental education is associated with adolescents' achievement. Conger, Conger, and Elder (1997), for example, found maternal education to be positively associated with GPA in grade 10, with adolescents whose mothers had higher levels of education reporting higher GPA's than those whose mothers had lower levels of education. Guo (1998), in an analysis of NLSY, found that adolescents whose mothers had more years of education had higher achievement test scores, after controlling for maternal cognitive scores and other background factors. Jordan and Nettles (1999), in an analysis of NELS data, found that family SES, a variable comprised of parental occupation status and family income, predicted math and science achievement in the 12th grade, with adolescents whose families had a higher SES performing better on tests of their science and math skills than those whose families had a lower SES. These relationship held even after controls were added for a number of background characteristics, such as 10th grade achievement, 10th grade self-concept, gender, race, hours worked, activities, and school-level factors. Gamoran (1992), in an analysis of High School and Beyond data, also found that higher levels of family SES, a composite variable comprised of ***parental education***, family income, father's occupation, and home resources, predicted higher individual level math and reading test performance, after accounting for background and school-level factors such as school mean SES, school type, prior achievement, gender, race/ethnicity, and academic track.

One study found that maternal cognitive ability is also related to adolescent achievement. Guo (1998), in an analysis of NLSY, found that adolescents whose mothers scored higher on cognitive tests had higher achievement test scores, after controlling for maternal education and a number of other background characteristics.

Studies examining the effects of ***family structure*** on adolescents' academic achievement have produced mixed findings; however, some evidence exists that adolescents living with two biological parents are more likely than those who do not to have higher levels of achievement. For example, Conger, et al. (1997), found that adolescents living in a household with a separated or divorced mother reported lower 10th grade GPA than adolescents living in households with two biological parents. Again, this is a sample of lower- to middle-class White adolescents in Iowa from largely two-parent households. However, McNeal (1999) found no significant

differences in the 10th grade test scores of adolescents who were in single parent households in the 8th grade in comparison to those living in a two-parent household in the 8th grade, even after controlling for important correlates of family structure, such as the adolescent's race, the family's SES, and the level of parental monitoring and involvement in school. Guo (1998), in an analysis of NLSY data, found that family structure was not significantly related to achievement outcomes, after accounting for background factors. Specifically, the proportion of years prior to the assessment in which the adolescents' mother was married, divorced, or never married had no influence on adolescent achievement after including the control for long-term poverty status.

Research has documented a relationship between adolescents' family size, or their ***number of siblings***, and their academic achievement. For instance, Conger, et al. (1997) found that adolescents living with a greater number of siblings had significantly lower GPA's in 10th grade than those living with fewer siblings in a sample of white adolescents in Iowa. Guo (1998), in an analysis of NLSY, found that children from family size was negatively related to reading recognition scores. Guo also found that children born later in sequence were more likely to have lower reading recognition scores. Likewise, Hanushek (1992) found the same negative relationship between family size and achievement among a sample of low-income Black 2nd through 6th graders. These findings held after controls for a number of other background factors were added. However, Hanushek also found within a sample of large families, those who fell early in the birth order had higher levels of achievement in the elementary to middle school years than those falling later in the birth order. Hence, the implications of living in a large family seem to be most severe among those who come along later, having experienced the larger family size during the younger years of life and, perhaps, for more years of their life than their older siblings. Downey (1995), in a cross-sectional analysis of national data, found that adolescents in large families have lower reading and math scores. These findings held after controlling for SES, as indicated by family income, parental education and occupation, family structure, urban residence, race, gender, and region. The interactions found between sibship size, or number of siblings, and parental resources may provide support for a parental resource dilution theory—a theory that posits that as the number of siblings increase, availability of parental resources, including time, interpersonal resources, and economic resources, decreases

A number of studies have found that parents who are involved in their adolescents' lives are able to influence their academic success, although certain forms of involvement appear to matter more than others. McNeal (1999) examined the relationship between ***parent involvement*** and science achievement in a national sample of students. The measures of parental involvement included parents' PTO involvement, the frequency of parent-child discussions, parental monitoring, and parents' use of educational support strategies. Greater frequency of parent-child discussions were related to higher levels of science achievement. However, he found that adolescents whose parents were more involved in PTO activities actually had lower levels of science achievement than adolescents who were less involved in these activities. Further, McNeal (1999) found that the relationship between parental PTO involvement and parental monitoring with adolescents' achievement was stronger for families with higher levels of SES than for those with lower levels of SES. Higher levels of parental monitoring were moderately related to lower levels of science achievement. The results were found after controlling for race, gender, SES, prior achievement, GPA, hours worked, hours of homework, having repeated a grade in school, and family structure. Gutman and Eccles (1999), in a path analysis of data on a sample of 617 Black and White adolescents from the Maryland Adolescent Development in

Context longitudinal study, found that adolescents from families with higher levels of family income were less likely to have parents who were financially stressed. Adolescents with parents' who reported feeling financially strained, as indicated by their reports of worrying about money and of having difficulty making ends meet, were less likely to be involved in their adolescents' school and were more likely to have negative relationships with their adolescents. Parental involvement was measured by parent and adolescent reports of parental attendance at open house events, parent teacher association meetings, and volunteering in classroom. Parent-adolescent relationships were measured by levels of harsh discipline and conflict between parents and adolescents reported by both parents and adolescents. Adolescents' achievement, as indicated by school records of their GPA, was positively influenced by parental involvement and was negatively influenced by negative parent-adolescent relationships (Gutman & Eccles, 1999). Catsambis (1998), in an analysis of NELS data, found that adolescents whose ***parents had high educational aspirations*** for them in the eighth grade had higher levels math, reading, and science test scores, after controlling for parental work status, family structure, prior achievement in the relevant subject, race, SES, and family size.

Involvement by nonresidential fathers is also related to adolescents' achievement. King (1994), in an analysis of NLSY data, found that greater levels of ***child support***, but not visitation, from non-residential fathers was related to higher scholastic competence and higher math and reading scores within a national sample of both children and adolescents whose parents were not married. This study controlled for the child's sex, race, birth order, region of residence, distance from father, mother's education, religion, and household income (from all but child support), current marital status, and time since divorce. However, Nord, Brimhall, and West (1997), in an analysis of National Household Education Survey (NHES) data, found that adolescents in grades 6 to 12 who were living with single mothers were more likely to get mostly A's when their fathers were highly involved over the past year, in comparison to children with fathers with low involvement. These findings held after controlling for background factors, such as race, sex, parental education, household income, maternal employment, extracurricular activity participation, prior suspension or expulsion, and current family structure.

Finally, Teo et al. (1996) found adolescents who experienced more positive ***early home environment*** had higher grades at grade 6 and age 16 than adolescents experiencing a less positive home environment in their early years. Further, they found that adolescents whose mothers reported lower life stress to have higher grades at grade 6 and age 16 than those whose mothers had higher levels of life stress, after controlling for IQ and other background variables.

In summary, adolescents' families have been consistently found to affect their academic achievement outcomes. Adolescents' achievement levels vary by their family background, including parental characteristics, family income, parental level of education, parental monitoring and involvement levels, number of siblings, and family structure.

Peers

Few studies have examined the relationship between and adolescents' peers and their educational outcomes.[8] Findings from one study, however, suggests that peers may have some

[8] Although some researchers identify studies on tracking or ability grouping as peer studies, in this review of the literature, we consider peers to be a selected friend or group of friends with whom an adolescent chooses to spend

influence on adolescents' academic achievement. For instance, Jordan and Nettles (1999) found that adolescents who spent greater time hanging out with their peers had lower levels of math and science achievement in the 12th grade than adolescents spending less time in these activities.

Neighborhood/Community/School

Numerous studies have examined how certain characteristics of adolescents' schools relate to their educational outcomes. Neighborhood, community, and school-level factors have been found to influence adolescents' academic achievement. Predictors of academic outcomes for adolescents include neighborhood-school factors, teacher background, school-type, and tracking.

School structure and composition are predictors of adolescent academic achievement outcomes; however, the findings are not always consistent and the relationships differ by subgroup. For example, Jordan and Nettles (1999), using NELS data, found that students in schools in urban areas and in schools with high ***percentages of minority students*** had lower 12th grade math and science achievement than their peers in rural areas or in schools with a lower percentage of minority students. The percentage of Black students at a school is associated with no difference in gain scores or slightly lower gain scores for Whites and Hispanics; however, it is not related to Black students' gain scores. A second study found that Hispanic adolescents attending schools with higher percentages of Hispanic students had higher gain scores than Hispanic students attending high schools with lower percentages of Hispanic students (Ehrenberg & Brewer, 1994). Lee and Smith (1995), in an analysis of NELS data, found that schools' level of minority concentration is not related to gains in achievement in math, reading, history, or science. Mean school SES also appears to be related to student achievement. For instance, Lee and Smith (1995) found that school SES was strongly related to gains in science. In additon, Marsh (1991b), in an analysis of High School and Beyond data, also found a relationship between the composition of schools and adolescents' achievement, finding that the higher the ***average level of school SES***, the higher students test scores were. This relationship was found even after controlling for important background characteristics. Yet, Marsh (1991b) also found that adolescents attending schools with higher mean levels of ability have moderately lower grade point averages than those attending schools with lower mean levels of ability. This unexpected finding may be due to differences across schools in grading systems. Also, given that attendance in high ability schools is predictive of decreased academic self-concept over time, this change in the psychological aspect of academic adjustment may indirectly predict decreased academic performance.

The relationship between ***school size*** and high school achievement is not clear. For example, Jordan and Nettles (1999), who analyzed NELS data, found that school size was related to adolescents' math and science achievement in the 12th grade, with those in larger schools showing higher levels of math and science achievement than those in smaller schools. These findings held after controlling for key individual, family background, and school-level characteristics, including race, gender, family-level SES, school engagement, and prior achievement. In contrast, Lee and Smith (1995), also using NELS data, found that smaller high school attendance is associated with higher gains in reading, history, math, and science

---

time. Given this definition, there have been few longitudinal studies documenting the relationship between peer characteristics or peer involvement and academic achievement.

achievement, after controlling for background factors, such as race or ethnic background, prior achievement, prior levels of school engagement, SES, and gender. These conflicting results may be partially explained by the results of a more focused study on school size using three waves of NELS data conducted later by Lee and Smith (1997). They found that the growth in reading and math is greatest among high school students attending schools enrolling between 600 and 900 students. This suggests a curvilinear relationship in which students at the more extreme small or large ends of the spectrum falling behind. Cotton, who reviewed 69 studies and syntheses that looked at the effects of school size on the academic achievement (40 on secondary school students), found that research is mixed with about half of the studies showing no relationship between school size and educational adjustment, including academic achievement and school engagement, with the others finding that smaller schools are related to better educational adjusument. She suggests that the benefits sometimes found in research of smaller schools may be explained by their structure, organization, and climate rather than just their size. More research is needed for the relationship between school size and achievement to be determined.

A number of studies have examined the relationship between school type and adolescents' academic achievement. Gamoran (1992), using High School and Beyond data, found that adolescents attending ***Catholic schools*** are more likely to have higher average academic achievement overall than those attending public schools. He also found that students attending Catholic schools are more likely to have higher individual average reading and math achievement at the school level. Lee and Smith (1995) also found that students attending Catholic high schools had higher math scores. The study findings suggest that Catholic schools' more ***fluid tracking system*** accounts for part of their education productivity advantages. These findings remained after accounting for individual, family background, and school-level factors, such as self-reported track membership in academic or nonacademic track, sex, race, an SES composite made up of parental education, paternal occupation, family income, and home resources and prior achievement, school level SES, and structural dimension of tracking in school (Gamoran, 1992). Gamoran (1996), using NELS data to analyze academic outcomes of around 4,000 students attending public magnet, public comprehensive, Catholic, and secular private schools, found that adolescents attending Catholic schools have higher math skills, and that other adolescents attending secular private schools do not have any academic advantage over those attending comprehensive public schools, after controlling for preexisting differences between the students. He found that adolescents who attend ***magnet public schools*** are more likely to have higher proficiency scores in science, reading, and social studies than attendance at comprehensive public schools (Gamoran, 1996). These findings remained after controlling for a number of individual, background, and school-level factors, including sex, race, family composition, prior achievement, percent of students in school receiving free/reduced lunch, racial composition, student course-taking, and student bonding (Gamoran, 1996).

The evidence presented above suggests that Catholic schools are more effective in improving adolescents' achievement factors, however, it is important to note that causality cannot be determined based on these analyses. Studies trying to compare achievement outcomes of students who attend Catholic or private schools to students attending public schools are limited in their ability to control for selection factors; that is, unobservable characteristics about motivational levels or other characteristics of parents and adolescents who attend private schools, for which they must pay, may account for some of the effects attributed to Catholic schools.

For example, one study that tried to take selection factors into account, using data from the NELS and the of the 1980 Census Population of New York State Public Use Microdata Sample (PUMS), found no evidence of significant differences between high school student math and reading achievement based on public or private school attendance (Goldhaber, 1996). These estimated results were found after controlling for the students' race and ethnic background, learning disabled background, religious background, parental education, and family income among other background factors. Using a methodology in which he tried to control for parental motivation, the student achievement scores were *predicted* using an estimation model. Goldhaber (1996) used this method to estimate the outcomes that a student *would have had* if he or she had attended a school in the alternate sector. After entering students' individual characteristics, schooling alternatives in the region, and the characteristics of the school they are attending, such as school SES and racial composition, he found no differences favoring private schools.

In sum, much of the research on school type and student outcomes shows that attendance at Catholic, private, and public magnet schools is related to higher achievement outcomes among adolescents. However, more research that tries to control for differences in parental and student motivation is needed to determine more accurately schooling sector effects on student achievement.

In addition to school type, school structural factors have been found to predict adolescents' academic achievement outcomes is ***tracking***, or the grouping of students based on ability and, in some cases, other factors. In an analysis of High School and Beyond data, Gamoran (1992) found that adolescents with a higher academic track status are more likely to have higher individual levels of math and verbal achievement, as indicated by their test scores. Argys, Rees, Brewer (1996), in an analysis of NELS data, found that students in lower tracks in the 8th grade have higher levels of math achievement when they are grouped with students of average ability in the 8th grade in comparison to students who remain in lower tracks in the 10th grade. However, they found that students in higher tracks in the 8th grade have lower gains in math achievement when they are grouped with average performing students in the 10th grade in comparison to students who remain in higher tracks in the 10th grade. Further, the estimated overall change in mean math achievement would be negative if "detracking" occurred between grades 8 and 10. These findings held after controlling for background factors, school characteristics, 8th grade track assignment, and prior levels of math achievement.

Two studies provide evidence suggesting that schools' tracking systems are related to students' academic outcomes. Schools with more ***mobility in their tracking systems*** have higher average math achievement overall (Gamoran, 1992). Track immobility led to increased levels of math and verbal achievement inequality at the school level, and it decreased math achievement at the school level. These results remained after controlling for prior achievement, gender, race, SES, school type, and school mean SES. The math and verbal gaps between students in higher and lower tracks is also smaller than they are in schools with more rigid, less inclusive tracking systems (Gamoran, 1992). In a later study using NELS data, Gamoran (1996) found similarly that schools vary significantly in the effects of their tracking system on academic outcomes. As was found in the High School and Beyond sample, students attending schools with more fluidity or mobility in their tracking systems have higher average math achievement overall. The math and verbal gaps between higher and lower tracks was also found to be smaller

than they are in schools with more rigid, less inclusive tracking systems. Lee and Bryk (1988), using High School and Beyond data, found that students who attend Catholic schools, which place greater percentages of students in college preparatory or academic tracks, are more likely to be in academic tracks, to take higher level courses, and to have higher levels of math achievement.

Slavin's (1995) review on the effects of cooperative learning environment on achievement outcomes for students at all grade levels found that students in these schools performed better than students in schools that did not use this approach. The effects were particularly strong for low achieving and very high achieving students.

Evidence on the effects of school resources on academic achievement outcomes has been mixed. Hanushek (1986) analyzed the results of 147 cross-sectional studies that looked at the effects of school resources, such as school expenditures, class size, and teacher pay on the achievement of children and adolescents. Hanushek found that the positive effects of school expenditures on students' achievement became insignificant once background factors of the students attending the schools are considered. This evaluation has been critiqued by many researchers for including many studies that did not control for prior achievement of students as they were cross-sectional. However, he replicated this general finding that there is no relationship between expenditures and other school resources and student achievement outcomes in a more recent meta-analysis of over 400 studies (Hanushek, 1997).

Contradicting Hanushek's findings are a number of studies that have independently evaluated various school resources that have been used to indicate school quality and found alternate findings. Among them, the most well-known is the Greenwald, Hedges, and Laine (1996a) meta-analysis of 60 studies that examined the relationship between school inputs and the achievement of children and adolescents. They find that various ***school resources*** are related to academic achievement, after controlling for background factors. A recent study uses instrumental variables to control for omitted variable bias and finds that additional school resources are significantly related to modest test score gains in a national sample of high school students (Ludwig & Bassi, 1999). Ehrenberg and Brewer (1994), using High School and Beyond data, found that overall test score gains were positively associated with increases in ***school expenditures***. This relationship was stronger for Black students than for White students. Figlio (1999), in an analysis of another school input using data on a national sample, found that ***instructional hours***, significantly predict student performance, after controlling for background factors. Debate has been ongoing on the matter, with a number of researchers critiquing the methodological soundness of other analyses (Greenwald, Hedges, & Laine, 1994; Greenwald, Hedges, & Laine, 1996b; Hanushek, 1996; Turner, 2000).

Another school-level factor that has been examined and found to predict adolescents' achievement outcomes is the background of their teachers. Teachers with ***content-specific training in the subject*** of math has been found to be more effective in increasing math achievement than are teachers without such credentials. Druva and Anderson (1983), in a meta-analysis of studies looking at the relationship between teacher background and students' science achievement, found that teachers' number of science courses taken, experience teaching biology (for biology students), and attendance at academic institutes were positively correlated with students' achievement outcomes in higher level science courses. Goldhaber and Brewer (1997),

in an analysis of NELS 8th and 10th grade data, found that higher math achievement is found in students with teachers with math training, after accounting for background factors. The sample was made up of 35,149 public school students from 638 schools with 2,245 different mathematics teachers.

In the study described above, Goldhaber and Brewer (1997) did not find teaching certification to predict math achievement. However, researchers have debated the methodology (sample) used by Goldhaber and Brewer and the teacher certification findings (Darling-Hammond, Berry, and Thoreson, 2001; Goldhaber and Brewer, 2001). A second study concluded that although teachers vary widely in teaching skill and effectiveness, these skills do not appear to correlate perfectly with training background or qualifications (Hanushek, 1992). In any case, it seems that more rigorous research is needed to decisively confirm or discount these findings.

Evidence on the importance of having a teacher with a higher level degree is mixed. White adolescents whose teachers had at least a master's degree had lower gain scores than those whose teachers had less than a master's degree, but Black students with teachers with at least a ***master's degree*** had higher gain in test scores than students whose teachers did not (Ehrenberg & Brewer, 1994). Goldhaber and Brewer (1997) found adolescents whose teachers had a B.A. or Master's degree did not have significant higher gains in math achievement, unless the degrees were in mathematics. Ehrenberg and Brewer (1994) found that gains in test scores between the 10th and 12th grades were positively associated with the ***average selectivity of the undergraduate institutions attended by their teachers***. This relationship was stronger for Black students than for White students.

Along with teachers' educational background, skills, and training, researchers have examined the effect of teachers' racial/ethnic background and gender on the achievement of those from a similar or different background, with mixed findings. Hanushek (1992) found that Black teachers were more effective than White teachers in improving scores of Black children in Baltimore. Further, it appears that Black teachers from low-income backgrounds were most effective in teaching low-income Black students. More recently, Dee (2001), in an analysis of data from Tennessee's Project STAR class-size experimental evaluation, found that having a teacher of the same race may improve academic performance among a sample of children and young adolescents. Students were randomly matched with teachers, so racial pairings were assigned independently. Results suggest that a one-year assignment to an own-race teacher increases achievement in math and reading scores by around three to four percentile points (Dee, 2001). Notably, these studies included samples of children who were not all adolescents. However, in an analysis of a national sample of high school students, an age range of focus in this review, Ehrenberg, Goldhaber, and Brewer (1995) found that although ***teachers' race, ethnicity, and gender*** appear to influence the subjective evaluations given to students, such as teacher expectations that the student would go to college and whether they would recommend the student for academic honors, their background characteristics did not influence student learning. Further, these differences in teachers' subjective evaluations did not seem to lead to bias in their objective scoring of students. These findings held after controlling for prior test scores, individual and family characteristics, school characteristics, 10th grade subject teacher, and the 10th grade subject class.

In sum, a number of neighborhood, community, and school-level factors have been documented as having some influence on adolescents' achievement outcomes. Among them, teacher background and characteristics, school type, school composition, and school structure all appear to affect achievement outcomes. Evidence is more mixed as to the effect of school resources, although more sophisticated methodological analyses seem to suggest that they do have some, albeit small, influence on student achievement outcomes.

Societal/Policy

In this section, class size, vouchers, and whole school reform efforts are reviewed. As it is very difficult to isolate results of policies on educational outcomes, this section relies heavily upon experimental research. Tracking, which is a policy implemented at the school level, is covered as a school-level input and examined in the section above on the neighborhood community, and school-level antecedents of adolescents' academic achievement.

Evidence on class size or teacher-pupil ratios and student achievement has been mixed. Research has found negative, positive, and insignificant relationships between class size or teacher-pupil ratio and student achievement (Hanushek, 1998). Hanushek found that differences in methodology appear to account for some of the variance in the findings. For example, analyses conducted at the state level or district level appear to produce evidence of positive relationships, while school-level data produce fewer significant results.

However, conflicting evidence is offered by the one major rigorous evaluation on class size--the experimental study of class size in Tennessee's Project STAR (Mostellar, 1995). Tennessee's Project Star was an experimental study of ***class size*** that began in 1985 and lasted for four years. 11,600 elementary school students were assigned to classrooms of differing sizes from when they entered Kindergarten through the end of the third grade. The target size for small classes, to which the treatment group was assigned, was 13-17 students, and control group students were assigned to a regular size class of 22-25 students. This study finds that children in smaller classes in elementary school grades K-3 outperform control group students in larger classes during that time period. These positive reading and math test performance results, so far, have been found to last through the 7th grade. The Lasting Benefits Study (LBS) found that 6th graders had higher test scores with .08 to .16. of a standard deviation on test scores. Among 7th graders, students who were placed in smaller classes retained their achievement advantage, with .14 to .26 of a standard deviation on test scores.

Students from disadvantaged backgrounds appear to gain more from small class size in early elementary years. Rivkin, Hanushek, and Kain's (1998) results supported the finding that low-income students benefited more from smaller classes in elementary school years.

A few rigorous studies have examined the relationship between being offered school vouchers and academic outcomes. Early evidence from experimental research on vouchers has shown them to have mixed effectiveness in increasing achievement among the students who receive them in comparison to those who do not. Howell, Wolf, Peterson, and Campbell (2000) examined the impact of offering ***privately-funded vouchers*** to parents in Washington, DC, Dayton, OH and New York City that they could use toward tuition for their children to attend

private schools. In their experimental evaluation, academic outcomes were analyzed for students who were randomly assigned to a group that was offered vouchers or another group that was not offered vouchers. Achievement outcomes for students in the Washington, D.C. program only as children in that city were in grades 2-8 at the baseline and some subgroup analyses were done for children in grades 6-8 and were presented in the report. Of the students who were offered vouchers, 53 percent used them to attend private school by the end of the program's first year. The study suffered from attrition problems, with the follow-up response rate of 50.3 percent; however, there were no statistical differences between response rates of those who were offered vouchers and the control group. The study found that among African Americans, the program had mixed, but more positive, achievement effects. In the first year after being offered vouchers, the overall achievement of 6th through 8th grade African Americans who were offered vouchers decreased by 8.8 percentile points. In other words, they trailed control group students who were not offered vouchers by 8.8 percentile points based on their combined reading and test scores. There was a decrease of 19 percentile points in reading, but there was no difference between the two groups math achievement, but there. In the second year, however, African Americans students receiving vouchers had scores that were 10.3 percentile points higher than African American students in the control group in overall combined achievement test performance, and they had scores that were 12.8 percentile points higher than control group students in math. No significant differences were found between the groups in reading by the second year evaluation. However, for adolescents of all other racial and ethnic backgrounds, vouchers had no impact on academic achievement outcomes, as indicated by math and reading or overall combined test scores (Howell et al., 2000). The effectiveness of privately funded vouchers, as demonstrated by early evidence from this study, is mixed for children of different racial and ethnic background, and appears to be somewhat positive in the longer run for African Americans who receive them.

Similar results were found in an experimental evaluation of a voucher program in New York City that looked at the effect of vouchers on the achievement of 3rd through 6th grade students who received vouchers to attend private schools (Myers, Peterson, Mayer, Chou, and Howell, 2000). 76 percent of the students who were offered school vouchers used them when offered, and 64 percent were using them two years later. Selection bias may also enter as a limitation given that a substantial number of students who were offered vouchers did not use them. However, the researchers tried to control for these selection factors in separate analyses and reported that their results were not biased significantly. This evaluation suffered from a moderately high level of attrition in the sample over time, with a 65 percent response rate in the most recent follow-up interview. The study showed that there were no overall differences between test performance of the scholarship group and the control group by the second-year follow-up. However, subgroup analyses showed that significant differences occurred among African American 6th grade students. Specifically, the researchers found that 6th grade students who had been offered school vouchers scored 7.92 national percentile ranking points in their combined math and reading higher than the control group students who were not offered vouchers. Similar differences were found in reading and math performance among African Americans based on their scholarship status.

While these two evaluations show some evidence of the effectiveness of vouchers for improving the scores of young adolescents African Americans to higher levels than they would be in their absence, it is important to note that these studies only looked at one aspect of vouchers. These studies were designed to examine differences between students based on

whether they were offered school vouchers. For instance, this study did not examine the effects of vouchers, or publicly funded school vouchers, in particular, on the public school system and on public school students' learning. It is not apparent if vouchers affect public school student performance positively or negatively. For example, some argue that competition and reduced class size results from students being offered vouchers and public schools respond by running more efficiently, thereby increasing scores for students offered vouchers and those not offered vouchers. Others believe that high achieving, highly motivated students from higher SES backgrounds (who seem to gain the least from the vouchers, after controlling for preexisting differences) will be more likely to have parents that seek out and attain vouchers; they are concerned that vouchers will lead to a change in composition and decreased school funding that will harm the school and its ability to create high performing students. Further, the larger school choice reform movement, which includes the establishment of charter schools, has not been rigorously evaluated thus far. More research is needed to decisively state the impact of vouchers and other school choice education reform efforts on academic outcomes of adolescents.

In sum, evidence from cross-sectional and longitudinal studies on class size has been mixed, however, experimental research shows that adolescents benefited from attending small classes during early elementary school years. Children from more disadvantaged families may benefit more from attending small classes. Evidence on the effectiveness of school vouchers in increasing the test scores of recipients is also mixed, but the two experimental studies that have looked at effects on adolescents showed that African Americans students who receive school vouchers seem to benefit from them and that students from other racial and ethnic backgrounds do not. Given the mixed age of the sample at the time of these initial follow-up reports, later results will be important for understanding the effects of privately-funded vouchers on adolescent outcomes. Both of the voucher studies suggest, but do not decisively indicate, that private schools are more effective in teaching African Americans than are the public schools that they would attend alternatively.

Literature searches have identified few whole school reform efforts that have been rigorously evaluated, meeting out standards for inclusion. One model of school reform that has gone through some rigorous review is the Talent Development High School with Career Academies (Herman, et al., 1999). These schools help to reorganize large schools to provide personalized focus on student academic and social needs. Through this approach, which has been adopted by schools in Philadelphia and Baltimore, schools are broken into smaller career-focused units. These smaller units are organized so that students who need extra help can be identified and receive extra academic guidance or personal counseling. Research on the Talent Development High Schools (much of which has been conducted by those who developed the program) finds that students in these high schools have higher performance growth on a math state exam, with smaller performance gains in reading and writing, in comparison to other students from other schools within the same district.

A second whole school reform model, High Schools That Work, has undergone reasonably rigorous review. However, many of these studies were also conducted by the developers of the schools. These high schools offer rigorous vocational courses, require additional academic courses, promotes work-based learning, provide personalized academic counseling and additional help outside of school. Students who attend well-implemented High

Schools That Work appear to perform better on the National Assessment of Educational Progress than comparison students from schools newly implementing the program (Herman, et al., 1999).

Programs that influence academic achievement

Attendance in a high quality early child care programs has been found to have long-term effects, lasting through adolescence. In his review of 36 model demonstrations of large-scale public programs, Barnett (1995) looked at long-term effects of participation in early childhood programs. Characteristics of the study samples varied by study and in many of the studies, the majority of participants were African American and/or were economically or academically disadvantaged. Children in the Perry Preschool program, for example, had low IQ scores (usually below 85). The average level of education of the mothers in these studies was low, with averages below 12 years in all of the studies and below 10 years in five of the studies. Most students in the control group began their schooling in Kindergarten, however, in the later studies, when options for preschool were more available, many students in the control or comparison groups could have attended preschool or early child care in some form. The findings suggest that participation in an early childhood program is related to higher levels of school achievement, lower levels of grade retention, and lower levels of placement in special education into the adolescent years. The strongest evidence of positive effects was found among the most rigorous experimental studies, those without high attrition rates, such as the Carolina Abecedarian, the Early Training Project, and the High/Scope Perry Preschool Project. Children's participation in the Carolina Abecedarian program was related to higher scores on achievement tests and fewer placements into special education. Likewise, the High/ Scope Perry Preschool increased children's grades and test scores through 12th grade. This program also increased high school graduation rates, though it did not affect special education placement. Further, children who attended the Early Training Project experienced lower rates of placement into special education through adolescence, although there was no difference in achievement test scores between children in the program and control groups.

Experimental studies have shown that youth development programs can be effective in improving academic outcomes as well. For instance, the Teen Outreach Program was developed to prevent teen pregnancy and academic failure among high school students (Allen, Philliber, Herrling, & Kuperminc, 1997). The program used a ***youth development approach*** combined with a prevention-focused approach, and included activities such as volunteering, tutoring, as well as classroom discussions about social issues and services. The authors of the study found that adolescents participating in the program were significantly less likely to fail a class than those in the control group. A second program, the Boys and Girls Clubs' Enhancing Education Program was developed to improve academic performance among youth in a disadvantaged community. The program used an ***academic-focused youth development*** approach, providing activities such as educational lessons, homework assistance, tutoring, computer activities, and recreational activities. An experimental evaluation found that this program increased academic achievement, as indicated by math, science, reading, spelling, history, science, social studies grades and overall GPA (Schinke, Cole, & Poulin, 2000). Finally, an experimental evaluation of Big Brothers/Big Sisters, a ***mentoring program*** with intensive case management, found that program participants had a modestly higher GPA's than members of the control group (Tierney, Grossman, & Resch, 1995).

Yet, not all youth development programs have been able to improve adolescents' academic achievement. The programs below, which were all evaluated experimentally, have shown mixed effectiveness in improving the academic achievement of their adolescent participants in comparison to control group students. For example, grades of program participants in Children at Risk, the Quantum Opportunities Program (QOP) and the Summer Training and Education Program (STEP), and Upward Bound, which are described below, were not found be significantly higher than those of control group youth.

The first program, Children at Risk was targeted toward middle school students living in disadvantaged neighborhoods. The program components were many and varied as the program used a whole-community approach involving school services, community and social services, and out-of-school activities. For instance, the program provided community-enhanced policing, intensive case management, juvenile justice intervention, family services, afterschool and summer program activities, tutoring and homework educational services, mentoring, and monetary incentives. Although program participants did not have higher grades than control group youth, the program did have a positive effect on adolescents' achievement, with those attending the Children at Risk program less likely to repeat a grade in school than control group youth (Harrell, Cavanaugh, & Sridharan, 1999). A second program, STEP, provided summer jobs and education remediation activities to disadvantaged high school students during the summer and offered some services during the school year. Although the STEP program was effective in increasing test scores of adolescents who participated in the program in the short-term evaluation, these effects faded by the time of the long-term evaluation. Evaluators believed that although the summer program was effective in preventing students from losing academic skills over the summer, the summer intervention may not have been long enough to have long-lasting effects (Grossman & Sipe, 1992). The third program, QOP, was targeted towards disadvantaged high school students. QOP offered a variety of activities, including tutoring, computer assisted instruction, homework assistance, life/family skills training, college preparation activities, community service participation, and financial incentives. Although program participants' grades were not significantly different from those of youth in the control group, their academic skills were rated higher. Finally, a fourth program, Upward Bound, is a program targeted toward low-income high school students whose parents did not attend college. Participants in this program were offered academic assistance and college preparation training along with academic and other classes. During the summer months, participants attend a program and are often housed in a college campus (Myers & Schrim, 1999).

Vocational or employment-based programs with the goal of improving employability have shown mixed effectiveness in improving other academic outcomes, such as achievement, as measured by school grades (Jekielek, Cochran, & Hair, 2001).

In sum, youth development and employment programs appear to have mixed effectiveness in improving adolescents' academic achievement outcomes. Programs that are more academically-focused, such as the Boys and Girls' Clubs educational enhancement program, may be more effective in improving the academic outcomes among their participants. Likewise, mentoring programs and high quality early childhood programs have been demonstrated to have positive effects on adolescents' achievement outcomes, especially for youth who are at high risk based on their low income status, prior academic performance, level of school readiness during their preschool years, their parent's education levels, and the characteristics of their neighborhood and school.

Summary

In sum, academic achievement is an important indicator of adolescents' educational adjustment, and, in turn, it predicts their success in later years of life. It not only has implications for their likelihood of completing high school and being prepared to enter college, but is also related to future employment and economic well-being.

A number of factors in adolescents' lives have implications for their future academic achievement. Indeed, research has identified a large number of individual, family, peer, neighborhood/school/community, and societal/policy level predictors of academic achievement.

The individual-level factors found to predict adolescents' academic achievement include their levels of academic ability, their prior levels of achievement, their psychosocial well-being, their gender, their race, their participation in extracurricular activities, and their employment. For instance, Black and Latino adolescents have lower average levels of achievement than White and Asian adolescents. With regard to an adolescent's gender, females receive higher grades, on average, than males, yet males perform higher on math and science tests on average. Further, adolescents with higher levels of ability have higher levels of achievement, on average, than those with lower levels of ability. Similarly, adolescent' prior achievement, as indicated by their earlier grades or test scores, is perhaps the most significant predictor of their current levels of achievement.

Adolescents' use of time outside of school is also related to their achievement outcomes. The amount of hours that adolescents work is negatively related to their achievement outcomes, with those working over 20 hours per week during the academic school year experiencing lower levels of achievement. Yet, there are different implications for working low to moderate hours each week or working during the summer months, neither of which has negative implications for adolescent achievement. Further, research suggests that the time adolescents spend participating in extracurricular activities is positively related to their achievement outcomes. In contrast, the amount of time that adolescents spend watching television each day seems to have little implication for their long-term academic achievement, although their use of other types of media, such as listening to the radio and music recordings, may have negative effects on their academic achievement.

A large number of family background variables have also been documented as predictors of adolescents' academic achievement. These include indicators of the socioeconomic status of adolescents' families, namely, family income and parental education; their family structure, including both the marital status of their parents and the number of siblings in their family; and parents' levels of involvement and monitoring. Greater levels of family income and parental education are associated with higher levels of achievement. Some studies provide evidence that adolescents raised with or living with two biological parents have higher levels of academic adjustment than adolescents from single-parent or step-parent families, although the effect of family structure on adolescents is not fully clear, as studies have produced mixed findings. Further, research has documented a negative relationship between adolescents' family size, or their number of siblings, and their academic achievement, with adolescents who have a larger number of siblings having lower levels of achievement, on average, than those with fewer siblings. Finally, research has consistently suggested that adolescents whose parents are more

involved in their lives have higher levels of academic achievement than those whose parents are less involved.

The scant evidence that is available on the relationships between characteristics of adolescents' peers and their academic functioning suggests that peers may influence on adolescents' achievement outcomes. Adolescents who spend greater amounts of time with their peers had lower academic achievement outcomes. However more research is certainly needed to provide more conclusive evidence on the effects of peers on adolescents' academic adjustment.

A number of studies have examined the effects of school type, school structure, and school context on adolescents' educational outcomes. Predictors of academic outcomes for adolescents include neighborhood-school factors, teacher background, school-type, and tracking, school size, average level of school SES, higher mean levels of ability, Catholic school and magnet public school attendance.

Research on class size and vouchers, two educational reform policies, has been mixed. Yet, experimental evidence has provided some evidence of positive implications for lower class sizes and the use of vouchers among African American and disadvantaged students.

Attendance in some high quality early child care programs have been found to have long-term positive academic effects on students, lasting through adolescence. Also, experimental studies have shown that some youth development program interventions, especially those with strong academic components, have proven to be effective in improving academic outcomes.

Educational Attainment

Introduction

In this section, we cover the determinants of educational attainment including high school completion or dropout and postsecondary school attendance and attainment. As with the other sections, this review of the literature is not exhaustive, rather it is a comprehensive review covering major antecedents of schooling outcomes.

The attainment of basic and higher level credentials is important for a number of reasons. Educational credentials are basic tools that help young people to make successful transitions into adulthood. Most jobs have a minimum requirement of a high school diploma or a G.E.D. for full-time workers, and many well-paying jobs that offer employment benefits and opportunities for advancement require postsecondary schooling. Therefore, the attainment of a high school diploma or its equivalent, though its value has decreased in the past few decades, leads to greater economic returns for adults than would likely be achieved without one (Entswisle, 1990). This may be one reason why employment status and income vary by level of education among adults. The unemployment rate among adults aged 18-34 with less than a high school education is much higher than it is among high school graduates; likewise, the unemployment of college-educated adults is lower than that of high school graduates (U.S. Department of Education, 2000). People with at least a high school diploma are less likely to use welfare benefits and, when they do, have shorter spells on welfare than those who lack a high school diploma or GED (Boisjoly, Harris, & Duncan, 1996). As expected, higher levels of postsecondary schooling is significantly related to greater levels of occupational status and attainment (Sewell, Hauser, & Wolf, 1980).

Antecedents

Individual

A number of individual level factors have been found to be predictors of high school completion, high school dropout, college attendance, and college completion. Participation in extracurricular activities, employment, health risk behaviors, and individual characteristics are among the variables that have been found to relate to adolescents' educational attainment, as are adolescents' levels of school readiness in early childhood, IQ, and psychological adjustment to school.

Numerous studies have documented a predictive relationship between ability or prior achievement levels and their high school completion. For instance, Leventhal, Graber, and Brooks-Gunn (2001) found, in an analysis of a sample of 251 African American urban children, that children with higher levels of ***school readiness***, as measured by verbal ability and cognitive test scores at age 4-5, were more likely to graduate from high school than students with lower levels of school readiness. In an analysis of nationally representative data from the High School and Beyond survey, students with higher levels of ***prior academic achievement*** were found to be less likely to drop out of high school (McNeal, 1995). Likewise, Cairns, Cairns, and Neckerman (1989), in an analysis of youth who were from suburban metropolitan and rural communities in the South, examined the predictors of dropping out of high school on a sample of 467 seventh graders from three middle schools who participated in a follow-up evaluation in the 11th grade. They found that adolescents with low levels of academic performance in the 7th grade, as rated

by teachers and school administrators, were more likely to have dropped out by the 11th grade in comparison to adolescents' with lower levels of prior academic performance (Cairns et al., 1998). Other studies have demonstrated this relationship between prior achievement and dropout (Astone & McLanahan, 1991;Weng, Newcomb, & Bentler, 1988).

Prior achievement is also associated with college attendance and completion. Borus and Carpenter (1984) found that high school seniors who had received ***remedial education*** were less likely to attend college than those who had not. Zaff, Moore, Papillo, and Williams (2001), in an analysis of a sample of 8,599 adolescents using the National Educational Longitudinal Study of 1988 (NELS) found that prior composite reading and math test scores were predictive of increased likelihood of attending college. These studies controlled for multiple background factors.

Other studies have documented the relationship between adolescents' high school achievement and academic-related characteristics and their likelihood to attend and complete college. In an analysis of predictors of college degree completion, Adelman (1999) followed the sophomore cohort of High School and Beyond study until they were age 30. Sample sizes varied by outcome examined as data were not complete for each variable, but all analyses appeared to include at least 3,000 respondents. In a model including only pre-college and family background controls, academic competence and course-taking behavior during high school, which was measured as a composite variable that made up of test score on the mini, enhanced SAT test, ***class rank*** and ***GPA***, and ***curricular rigor*** or number of credits completed in intense, academic courses and courses commonly required by colleges, such as foreign language and higher level math and science, was found to be the strongest predictor of college completion. Marsh (1991b) also found ***course-taking behavior***, ability, being in the academic track, and GPA to be independently predictive of college attendance. These findings held after controlling for background factors.

Individual ***ability*** or genetic factors also account for some of the differences in educational attainment. Heath, Berg, Eaves, et al. (1985) studied the heritability of educational attainment using Norwegian twin data on a sample of 4,608 twin pairs. Among women, genetic factors accounted for 38-45% of differences in educational attainment, and family environmental background factors account for 41-50% of differences in educational attainment. Among men, the heritability of educational attainment was found to be higher. Specifically, 67-74% of the variance in educational attainment is explained by genetic background, while 8- 10% of educational attainment was found to be accounted for by familial factors. In an analysis of National Longitudinal Survey of Youth (NLSY) data on 1,943 full siblings and 129 half-siblings, Rowe, Vesterdal, and Rodgers (1998) found that variance in education is significantly predicted by genetic differences in ability as well as environmental background differences.

Evidence on ***gender*** predicting likelihood to complete high school has been mixed. However, more often studies have shown that females are more likely to graduate from high school after controlling for other factors. Haveman and Wolfe (1995), using Panel Study of Income Dynamics (PSID) data, found that Black females had an increased likelihood of graduating from high school and having more number of years of schooling completed than White males, after controlling for background factors. Leventhal, Graber, and Brooks-Gunn

(2001), in a sample of urban African Americans, found that females were also more likely to graduate from high school than males.

Evidence is also mixed as to the effects of ***gender*** on college attendance, but most research has shown that females are more likely to attend college after controlling for background factors. Marsh (1991c), in an analysis of a nationally representative data set, found that females are more likely than males to attend college, after controlling for background factors. He found this difference to be largely mediated by differences in psychosocial and behavioral factors, including their higher average academic self-concepts, school effort, and grades. Similarly, Zaff, et al. (2001) found that males were more likely to attend college after controlling for a set of background, parental control, and school-level factors. Haveman and Wolfe (1995) found that being a Black female increased the likelihood of attending college, after controlling for background factors. Similarly, Borus and Carpenter (1984) found that males were less likely to attend college. However, Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, did not find gender to be significantly related to likelihood to attend college.

Students who are behind in grade for their age are likely to have repeated at least one grade. Therefore, ***age for grade*** is commonly used as a proxy in research for grade repetition. A number of studies demonstrate a relationship between repeating a grade and dropping out of high school. Jimerson, Carlson, Rotert, Egeland, and Sroufe (1997) found that repeating a grade is a predictor of dropping out of high school. McNeal (1995) found that students who were older than average were nearly twice as likely to dropout than their younger peers. Leventhal, Graber, and Brooks-Gunn (2001), in a sample of African American urban adolescents, found that adolescents who had repeated a grade were three times more likely to have dropped out of high school than those who never repeated a grade.

Repeating a grade in school or being behind in grade for age also predicts decreased likelihood of attending college. Borus and Carpenter (1984) found that high school seniors who were two or more years behind modal grade were less likely to attend college than those who were not behind in grade for age. Leventhal, Graber, and Brooks-Gunn (2001), in a sample of African American urban adolescents, found that adolescents who had repeated a grade during grades 1-6 were less likely to attend college. Zaff, et al. (2001) replicated these findings in an analysis of national data with their finding that students who had repeated a grade prior to the eighth grade were less likely to attend college than those who had not. All these studies controlled for background factors.

Racial and ethnic background has been found to predict likelihood to graduate from high school. Research has consistently demonstrated that Black and Hispanic adolescents are more likely to graduate from high school than White adolescents after controlling for background factors such as SES, although Blacks and Hispanics, even more so, are less likely to graduate from high school than Whites. Blacks and Hispanics are less likely to drop out after controlling for prior achievement as indicated by test performance and SES (McNeal, 1995). Haveman and Wolfe (1995) found that being Black and that being a Black female independently increased likelihood of graduating from high school and number of years of schooling completed, after accounting for background factors. Among adolescent males who were disadvantaged, as indicated by the their mother's status as a high school noncompleter, Blacks

and Hispanics were found to be more likely to graduate from high school and to attend college than Whites (Tienda & Ahituv, 1996). Mensch and Kandel (1988), in an analysis of NLSY79 data, found that being black was associated with decreased likelihood of dropping out of high school in comparison to being White, while being Hispanic was associated with a decreased likelihood of dropping out of high school in comparison to being White for women only. Cairns, Cairns, and Neckerman (1989) found that Black adolescents, in their analysis of a mostly Southern and rural/suburban sample, were less likely than White adolescents to have dropped out by 11th grade. Race/ethnicity is also associated with likelihood to attend college. Haveman and Wolfe (1995) found that being a Black female increased the likelihood of attending college, after controlling for background factors. Among adolescent males who are disadvantaged, as indicated by their mother's status as a high school noncompleter. Zaff, et al. (2001) found that Asian/Pacific Islanders, Hispanic, and Black adolescents were more likely to attend college than Whites after controls for background factors, prior achievement, and family processes. A third study replicates the finding that Blacks and Hispanics are more likely to attend college than Whites (Tienda & Ahituv, 1996). Among advantaged adolescent males, Whites are more likely to attend college than are Blacks. Hispanic sons of higher educated mothers were more likely than Blacks of similar backgrounds to attend college.

In a model including only pre-college and family background variables, Blacks, Latinos, andAmerican Indians were moderately less likely to complete college than Asians or Whites (Adelman, 1999). However, when college performance and attendance pattern controls were added, race became insignificant as a predictor of college completion.

Some studies have demonstrated an increased risk of high school dropout among adolescent who are involved in health risk behaviors, such as ***drug use, pregnancy*** **and** ***fertility.*** Mensch and Kandel (1988), in an analysis of a sample of 6,217 women and men aged 19 to 27, examined the relationship between high school dropout and drug use, including alcohol, tobacco, marijuana, and other illicit drugs using NLSY data. For both males and females, later age of drug use initiation decreased likelihood of dropping out of high school. For males, later alcohol, marijuana, and other illicit drug use initiation decreased the likelihood of dropping out of high school. For females, later cigarette use and marijuana initiation decreased the likelihood of dropping out of high school. They also found that any type of drug use initiation occurring prior to dropping out was associated with an increased likelihood of dropping out among men and women (Mensch & Kandel, 1988). In addition to drug use, participation in three or more delinquent activities at one point in time was associated with an increased likelihood of dropping out of high school. These findings were constant after controlling for mother's education, father's education, ace/ethnicity, family structure, urban residence, region, academic ability, locus of control, self-esteem, sexual intercourse initiated prior to dropout risk, age of first pregnancy, age of drug use initiation, drug use initiated prior to dropout risk. French and Conrad (2001), in an analysis of a predominantly White sample of 1,156 adolescents from upstate New York, also found that earlier drug use predicted later academic adjustment, as indicated by GPA, educational attainment, and educational aspirations.

Research suggests that the adolescents with higher levels of *problem behavior* were less likely to graduate from high school than peers with less problem behavior (Leventhal, Graber, & Brooks-Gunn, 2001). Another study found that adolescents who reported that they were frequently in trouble or involved in delinquent activities had higher levels of dropout than

adolescents who did not report to be in trouble often (Marsh, 1991b). Likewise, Cairns, Cairns, and Neckerman (1989) found that adolescents with high levels of *aggression*, as rated by teachers and school administrators, were more likely to have dropped out by the 11th grade. Their analysis included 467 seventh grade students from three middle schools who participated in a follow-up interview four years later. The findings held after accounting for teacher ratings of interpersonal competence (e.g., peer aggression, popularity, academic competence, appearance, competitiveness, sports participation); socioeconomic status; peer group membership and status; maturational status; and age for grade.

A number of studies have found that adolescents' sexual risk-taking behaviors and early childbearing and parenting are related to the years of schooling they complete. Cairns, Cairns, and Neckerman (1989) found that ***early parenthood*** also predicted high school dropout. All of the 15 students who reported being parents dropped out of high school, including boys and girls in the lower risk, average-achieving clusters. Later intercourse initiation was associated with decreased likelihood of dropping out for males and females. Later initial pregnancy was associated with decreased likelihood of dropping out among women, after controlling for background factors (Mensch & Kandel, 1988). Klepinger, Lundberg, and Plotnick (1995), in a national analysis of a sample of 2,795 women, found that giving birth before age 20 was moderately associated with a decrease of nearly three years of schooling completed by age 25 among Blacks, Hispanics, and Whites. Giving birth to a child before age 18 is found to be moderately associated with fewer years of schooling (1.2 years lower) completed by age 25 for Blacks only. These findings held after controlling for background factors, including religiosity, parental education, family structure, number of siblings, and foreign-born status, and further controlling for the endogeneity of educational attainment. Similarly, Myers, Moore, Morrison, Nord, and Brown (1992), using NLSY data, found that later age of first birth was associated with the highest grade completed. In an examination of the literature on the relationship between adolescent pregnancy and high school completion, researchers have found that women who become pregnant early are less likely to complete high school (Nord, Moore, Morrison, Brown, & Myers, 1992). Debate as to whether the relationship between adolescent fertility and educational attainment is causal has been ongoing, however, some research demonstrates that a small, but predictive, relationship after controlling for endogenous and background factors is presented (Nord et al., 1992).

In contrast, participation in health risk behaviors, including rebelliousness, drug use, and adolescent fertility, were not found to be predictive of college attendance in two studies reviewed. Using longitudinal data on a mostly White sample of students from upstate New York counties who were aged 5 to 10 when the study began and aged 21 to 26 at the last of four follow-ups, French and Conrad (2001) examined the relationship between aggression and educational outcomes. Data were collected on aggressive behaviors, drug use data and academic achievement, educational aspirations, and educational level data were collected when the sample was aged 15 to 20. Data on unconventionality, as indicated by measures of rebelliousness and responsibility, and work involvement were collected when the sample participants were aged 15 to 20 and again when they were age 21 to 26. They found no relationship between drug use and college involvement. Borus and Carpenter (1984) found no difference in college attendance of high school seniors based on whether they had a child. However, *having a child* by age 22 was associated with decreased likelihood of college completion by age 30 in one study (Adelman, 1999).

Certain psychosocial characteristics of adolescents, such as self-esteem, perceived academic concept, educational expectations, and aggression are significantly related to high school completion or high school dropout. Finn and Rock (1997) found that students with higher ***self-esteem*** distinguished resilient students who drop out of school in comparison to those who remain in school in spite of poor grades and/or test scores; this finding is consistent across population race and gender subgroups, and when SES and family structure were controlled for. Leventhal, Graber, and Brooks-Gunn (2001) found that Black urban adolescents with higher levels of ***perceived academic ability*** at ages 16 to17 were more likely to graduate from high school than adolescents with lower levels of perceived academic ability. Along with other psychological indicators, ***educational aspirations*** have been found to predict educational attainment. Using longitudinal data on a mostly White suburban sample of students from upstate New York counties who were aged 5 to 10 when the study began and aged 21 to 26 at the last of four follow-ups, French and Conrad (2001) found that and earlier educational aspirations, at ages 15 to 20, predicted later academic orientation, as indicated by educational aspirations, GPA, and educational attainment. These results held after controlling for gender and academic achievement. Most of the sample was White, so race did not need to be controlled for. However, the SES of the sample was diverse and SES did not appear to be controlled for. Adolescents with higher levels of ***school attendance***, who expected to attend college, and who reported to have ***positive attitudes toward school*** were less likely to have dropped out of high school and more likely to have received a diploma or GED than students with lower levels of attendance and less positive attitudes toward school (Astone and McLanahan, 1991). Another study found that students who were frequently absent when they were not ill had higher levels of high school dropout than those who were absent less frequently (Marsh, 1991b).

Psychosocial factors have been found to predict likelihood to attend college among adolescents. Marsh (1991), in an analysis of High School and Beyond, found psychosocial and factors to be independently predictive of higher levels of college attendance including educational aspirations and ***academic self-concept***. Zaff, et al. (2001) found that adolescents' ***locus of control*** predicted their likelihood of attending college. These finding held after controls were added. Likewise, Borus and Carpenter (1984) found that high school seniors who reported that they expected to attend college were much more likely to attend college than those with lower ***educational expectations***, after controlling for background differences. In a model with only pre-college and family level variables, Adelman (1999) found that educational aspirations were associated with higher likelihood of college completion. Yet, after college performance and attendance patterns were taken into account after students began attending college, prior educational aspirations were not significantly predictive of college completion.

Participation in extracurricular activities has also been found to be associated with lower levels of high school dropout. Mahoney and Cairns (1997) found that among at-risk students (with lower levels of social and academic competence as rated by teachers), the dropout rate was significantly lower among students who participated in extracurricular activities. Extracurricular participation was modestly related to dropout among adolescents who were judged as academically and behaviorally competent during middle school. These findings held after controlling for SES, parental occupation, race, academic and behavioral competence as measured earlier by teachers, aggression, and popularity. McNeal (1995), using High School and Beyond data, found that adolescents who participate in sports clubs and fine arts activities

are less likely to dropout than students who did not participate in those activities. However, after controlling for participation in academic and vocational clubs, the relationship between participation in fine arts and high school dropout lost its significance. These findings remained after controlling for background factors.

Two studies have shown that participation in extracurricular activities during high school also predicts increased levels of college attendance. Eccles and Barber (1999), using data from a sample of 1,259 mostly White adolescents from Michigan, examined the relationship between extracurricular activities and educational attainment. 10th grade participation in team sports, school leadership or school spirit activities, and academic clubs were all independently found to be predictive of higher levels of full-time college attendance, after controlling for gender, verbal and math ability, and parental education. However, Eccles and Barber (1999) also found that 10th grade participation in the performing arts was not predictive of full-time college attendance. Zaff, et al. (2001), in an analysis of NELS data, found that student participation in extracurricular activities is a predictor of likelihood to attend college, after accounting for SES, family structure, race/ethnic background, number of siblings, prior reading and test score composite, whether retained in grade prior to eighth grade, status of having an emotional or other student disability, and a set of parenting, school, and peer controls.

The relationship between adolescent employment and high school completion has been well-documented. Many studies have examined the implications of adolescents' work, including work type, work status, and work intensity, on their schooling outcomes. For example, Tienda and Ahituv (1996), in an analysis of a sample of adolescent males using NLSY data, found that adolescent males between the ages of 17 and 19 who did *not* work at all during the prior year were more likely to withdraw from school. However, as the number of hours they worked increased, adolescents were more likely to withdraw from school. One study found a positive relationship between *duration of work* and high school completion. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of 251 firstborn children of low-income African American adolescent mothers in Baltimore (born in the1960s), examined the effects of adolescent employment on the transition to adulthood. They found that adolescents who worked earlier were more likely to graduate from high school than their peers who did not. Adolescents who worked consistently during adolescent years were more likely to graduate from high school. These findings held after controlling for prior achievement, family structure and other background factors. The ***season and type of work*** in which adolescents are involved may also influence their probability of graduating from high school. McNeal (199) found that students in certain job types were less likely to drop out than nonworkers. Yet, he also found that school year workers are more likely to drop out of high school than nonworkers. Namely, students who do less than 14 hours per week of baby-sitting, lawnwork, odd jobs, and farming work in the tenth grade were found to be significantly less likely to dropout than nonworkers. Workers in manufacturing, service, and "other" job industries were more likely to drop out than nonworkers. Retail jobs were not found significantly associated with likelihood to drop out for males or females. These findings remained after controls for GPA, overall achievement, family structure, retention, extracurricular involvement, gender, race, and SES. For analyses of occupational groupings, number of hours worked was added as a control.

Numerous studies have found that ***work intensity***, or weekly hours of work, is associated with decreased levels of high school completion. The National Research Council (1998), in their

review of research on employment and educational outcomes, found a consistent negative association between working over 20 hours during high school and high school completion. Steinberg and Cauffman (1995), in their review of studies looking at developmental outcomes of adolescent employment, found a negative relationship between working 20 or more hours per week and years of schooling completed. Marsh (1991), in an analysis of High School and Beyond data on a sample of 10,613, found hours of employment during 10th grade to be predictive of dropping out by the 12th grade. D'Amico (1984) found that students who worked over 20 hours per week were more likely to drop out of high school than students who worked fewer than 20 hours per week. McNeal (1997), using High School and Beyond data, also found that higher levels of employment were positively, linearly related to dropping out of high school. These studies controlled for background factors. Chaplin and Hannaway (1996) use High School and Beyond data to examine the relationship between high school employment and educational attainment. Among students who were not considered to be at-risk, there was a decreased likelihood that they attained a high school diploma. They found that working over 15 hours per week during sophomore year is associated with decreased levels of school enrollment in senior year for both Blacks and Non-Blacks. They also report that students who worked low or high hours were more likely to attain a GED than students who worked a moderate number of hours. These findings remained after accounting for background factors, including prior achievement track status, history of grade retention, race, SES, and family structure, and percent of students in school who are disadvantaged

In addition to predicting high school completion, ***high school employment*** is associated with decreased likelihood of attending college. Borus and Carpenter (1984) found that unemployment status of youth was not predictive of college attendance among a sample of high school seniors. Tienda and Ahituv (1996), using NLSY data in an analysis of 2,553 youth, found that work intensity has a greater effect on school continuation decisions of disadvantaged male youth. School continuation decisions of Hispanic male adolescents are more sensitive to hours worked than Whites. Black male school continuation decisions are less sensitive to hours worked than Whites (Tienda and Ahituv, 1996).

Chaplin and Hannaway (1996) also found that high school employment was related to the attainment of an AA or a BA degree. Working 15-29 hours is found to be moderately associated with decreased likelihood to be in school four years after sophomore year for at-risk students. It appears that an educational delay effect may result from intense levels of work during high school. While high levels of working are associated with increased post-high school employment and decreased post-secondary school enrollment, high levels of working predicts increased likelihood to be enrolled in school eight years after high school's end.

Summer employment appears to have different implications for adolescents' schooling outcomes. One study found that working during the summer was not significantly related to postsecondary attendance (Marsh, 1991b).

In summary, participation in extracurricular activities, employment, psychosocial factors, health risk behaviors, and individual characteristics. Individual level characteristics, such as race, gender, and individual ability appear to be related to their schooling outcomes. Adolescents who participate in extracurricular activities are more likely to graduate from high school and to attend college than those who do not. Adolescents who work over 20 hours per

week during the school year are less likely to graduate from high school or to attend college than those who work fewer hours. The relationship between weekly hours of employment and educational attainment may not be linear, as implications for lower levels of employment appear to be different. Studies have shown that working fewer than 15 hours per week is not related to educational attainment, while others have shown that adolescents who work fewer than 15 hours per week have positive schooling outcomes. Participation in health risk behaviors, including early childbearing and delinquent behaviors, such as aggressive behaviors and problem behaviors, are all predictors of increased likelihood of dropping out of high school. However, these behaviors do not appear to be related to college attendance. Last, students who have high educational expectations are more likely to complete more schooling than students with lower educational expectations.

Peers

Research suggests that peer relationships are related to high school completion. However, it is difficult to determine if selection factors or predictive factors are instrumental in peer analyses. French and Conrad (2001), using data from a mostly White sample of 1,157 8th and 10th grade students from the Pacific Northwest whose families had higher than average incomes, analyzed the relationship between antisocial behavior and dropout. Their results suggest that adolescents who are antisocial and rejected by their peers are more likely to drop out of high school than students who are not. These findings remained after controlling for gender and prior achievement. Likewise, Cairns, Cairns, and Neckerman (1989) found that 8th and 10th grade adolescents exhibiting antisocial behavior were more likely to drop out of high school. Adolescents who had social preference in their schools and adolescents who were socially isolated or who were popular were not less likely to drop out of high school. Having an antisocial status in conjunction with low social preference measured together was found to be moderately predictive of dropping out among the 10th grade sample. Further, adolescents who dropped out were likely to have affiliated with other students who dropped out of high school.

One study found that ***peer relationships*** can influence college attendance rates. (Zaff, et al., 2001) found that positive peers influenced college attendance among adolescents in the study. On the other hand, adolescents with peers who were negative influences were found to be less likely to attend college.

Family

A large number of family-level factors have been found to predict adolescents' educational attainment outcomes. Socioeconomic status, parental education, family income, public assistance receipt, family structure and size, parental characteristics, and parental involvement are among them.

Socioeconomic status (SES), as indicated by family income and parental education, is associated with higher levels of likelihood to complete high school. McNeal (1995), for example, found that high SES students are less likely to drop out of high school. Haveman and Wolfe (1995) found that family income/poverty ratio increases the likelihood to graduate from high school, after controlling for background factors. They also found that the number of years of poverty decreases number of years of schooling completed, after controlling for background factors. Last, they found that number of years spent with family's post-tax income was below

the poverty line decreased likelihood to graduate from high school, after controlling for background factors.

SES, as indicated by family income and parental education level, is also associated with increased likelihood of attending college. Studies have consistently shown that SES increases likelihood of attending college. Haveman and Wolfe (1995) found that the family income/poverty ratio is predictive of increased likelihood of attending college, after controlling for background factors. McNeal (1995) found that high SES students are less likely to drop out of high school. Zaff, et al. (2001) found that ***SES***, a composite variable, comprised of parental education, parental occupation, parental employment status, and family income was predictive of college attendance. Further, Hauser and Sweeney found ***poverty*** was a stronger predictor than family structure of graduating from college. In a model including only pre-college and family background variables, SES was found to be associated with the likelihood of completing college (Adelman, 1999). When college performance, and attendance pattern controls were added, SES was moderately associated with higher levels of college completion (Adelman, 1999).

Evidence on the relationship between adolescents whose families received public assistance receipt and their educational attainment is mixed. One study found that poor adolescents whose families receive public assistance for a longer number of years was related to higher levels of completed years of schooling, while other studies have suggested a negative relationship between receipt of public assistance and educational attainment. Haveman and Wolfe (1995) found that the number of years adolescents' families received AFDC while living in poverty was related to the completion of higher years of schooling, after controlling for background factors. However, they found that AFDC receipt was not significantly related to likelihood to graduate from high school, after controlling for background factors. McLanahan (1985), in an analysis of Panel Study of Income Dynamics (PSID) data, found that adolescents living in families receiving welfare were less likely to be in school at age 17. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, found that number of years on welfare was not associated with likelihood to graduate from high school. However, they found that ***number of years on welfare*** was associated with a lower likelihood of attending college attendance.

A number of studies have demonstrated a significant, positive relationship between *parental education* level and the likelihood of graduating from high school. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, found that children whose mothers graduated from high school were moderately more likely to graduate from high school. Haveman and Wolfe (1995), in their analysis of PSID data, found that having a mother who graduated from high school or a father who graduated from high school increased adolescents' likelihood of graduating from high school, after controlling for background factors. Myers, Moore, Morrison, Nord, and Brown (1992), in an analysis of NLSY, found that having better-educated parents was associated with higher number of years of schooling completed. Mensch and Kandel (1988) found that paternal education was associated with decreased likelihood of dropping out of high school for both men and women. However, maternal education was associated with decreased likelihood of dropping out of high school for women only. Haveman and Wolfe (1995) found that having a mother who was a college graduate or a father who was a college graduate were not significantly predictive of likelihood to graduate

from high school, after controlling for background factors; however they found that having parents who were college graduates to increase number of years of schooling completed.

Research has also shown that ***parental education*** is associated with increased probability of attending college. Haveman and Wolfe (1995) found that parental education, as indicated by high school graduation, attending some college, and having a father who is a college graduate, is related to a higher likelihood of attending college, after controlling for background factors. Borus and Carpenter (1984) found that high school seniors whose fathers were high school graduates were more likely to attend college than those whose fathers were not. Parental educational attainment was also found to be a significant predictor of college attendance of rural students in an analysis of a national sample (Smith, 1995).

Evidence of the effects of ***family structure*** on high school completion is somewhat mixed; however, most research has demonstrated that adolescents growing up with both biological parents are more likely to graduate from high school than those who do not. Mensch and Kandel (1988) found that ***not growing up in a two-parent, biological family*** increased the likelihood of dropping out of high school. Similarly, McNeal (1995) found that living in a ***single-headed household*** is associated with an increased likelihood of dropping out, after controlling for prior achievement, academic track, SES, age, gender and race. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, also found that number of years the father was present was associated with increased likelihood to graduate from high school. In an analysis of a PSID data, McLanahan (1985) found that White adolescents who had recently experienced a parental ***marital separation*** were less likely to be in school at age 17 than adolescents who lived with both of their biological parents. Among Blacks, she found that adolescents who had recently experienced a parental marital separation, a ***parental divorce***, or a ***paternal death*** were less likely to be in high school at age 17 than adolescents living with two biological parents. White and Black adolescents living in families headed by never-married mothers and those living with both parents did not differ significantly. Decreased income and increases in family stress account for much of the negative educational attainment effects of growing up without two biological parents among Whites (McLanahan, 1985).

Another study, in an analysis of NLSY data, showed that adolescents who experienced a recent parental divorce at age 14 were less likely to graduate from high school than those living in two-parent families (Sandefur, McLanahan, & Wojtkiewicz, 1992). These findings held after accounting for background factors, including race, gender, parental education, number of siblings. Adolescents from ***step-families***, single parent families, and ***"other" type families*** were more likely to have dropped out and less likely to have received a diploma or GED than those living with both parents (Astone & McLanahan, 1991). These results were found using High School and Beyond data after controlling for race, SES, region, residence, sex, number of siblings, academic ability, and school dropout rate (Astone & McLanahan, 1991. However, in her review of studies looking at parent absence, poverty and child and adolescent outcomes, McLanahan (1997) finds that growing up in a household with a ***never-married*** or divorced mother is associated with lower levels educational attainment, with children of never-married mothers having somewhat worse educational attainment outcomes. The educational attainment of children in stepfamilies was not found to be as strongly affected as those growing up in never-married or single, divorced mothers. Haveman and Wolfe (1995), in an analysis of PSID data,

found that ***number of parental remarriages*** predicted decreased number of years of schooling completed, after controlling for background factors. They also found that the number of years spent living with a single parent to be predictive of decreased likelihood of graduating from high school and number of years of schooling completed, after controlling for background factors.

Evidence on the effects of ***family structure*** and composition on college attendance is mixed. Haveman and Wolfe (1995) found that living with a single parent is not significantly related to likelihood of attending college, after controlling for background factors. Similarly, Borus and Carpenter (1984) found that absence of a parent at age 14 was not related to college attendance among a sample of high school seniors. Teachman, Paasch, and Carver (1997) found that family structure did not predict college attendance, college graduation, or completed years of schooling. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, found that father presence actually predicted lower likelihood of entering college and a greater likelihood of entering the workforce by age 19. Likewise, Zaff, et al. (2001), using a national data set, found that adolescents from single parent households were more likely to attend college in comparison to adolescents from two-parent families. In contrast, Hauser and Sweeney found that adolescents growing up without two biological parents were less likely to attend college. They further found that divorce was a stronger predictor of decreased college attendance than family income. Similarly, Axinn, Duncan, and Thornton (1997), using PSID data, found that adolescents living without both biological parents were more likely to have lower levels of educational attainment than adolescents growing up with both biological parents.

Number of siblings and having a later ***birth order*** among siblings is associated with a decreased likelihood of graduating from high school. Haveman and Wolfe (1995) found that adolescents' number of siblings predicts their likelihood to graduate from high school as well as the number of years of schooling that they complete, after controlling for background factors. They also found that being the firstborn child increased likelihood of graduating from high school. Myers, et al.(1992), in an analysis of NLSY data, found that an adolescents' number of siblings was associated with fewer years of schooling completed among the older cohort sample. However, evidence on the relationship between adolescents' number of siblings and their likelihood to attend college is mixed, with most of it showing that adolescents' number of siblings is not related to their schooling outcomes. Haveman and Wolfe (1995) found that adolescents' number of siblings was not significantly related to their likelihood of attending college, after controlling for background factors. Similarly, Borus and Carpenter (1984) found that number of siblings was not predictive of college attendance among a sample of high school seniors. Haveman and Wolfe (1995) found that number of siblings was not significantly related to likelihood of attending college, after controlling for background factors. Similarly, Borus and Carpenter (1984) found that number of siblings was not predictive of college attendance among a sample of high school seniors. To the contrary, Zaff, et al. (2001) found that adolescents with three or more siblings are less likely to attend college than adolescents from smaller families.

Parental characteristics have been found to predict adolescents' likelihood of graduating from high school. Haveman and Wolfe (1995) found that growing up with a *disabled head of household* predicts a lower likelihood of graduating from high school and number of years of schooling completed, after controlling for background factors. Borus and Carpenter (1984) found that *children of foreign-born* mother born outside United States were less likely to attend college. Haveman and Wolfe did not find that adolescents' religious background was related to

graduating from high school, after controlling for background factors. However, they did find that adolescents from ***Catholic families*** were more likely than young people with no religious background to complete more years of schooling. Another study showed found that adolecents' weekly or occasional ***attendance of religious services*** predicts their likelihood of attending college (Zaff, et al., 2001). Findings from two studies indicate that maternal employment may positively predict educational attainment. Haveman and Wolfe (1995) found that the number of years that the adolescents' mothers worked increased their likelihood of graduating from high school, after controlling for background factors. Leventhal, Graber, and Brooks-Gunn (2001), in an analysis of a sample of Black urban children, found that ***adolescents whose mothers were employed*** during the first 15 years of their life were more likely to attend college.

The evidence on the availability of educational resources in the home and educational attainment is been mixed. Myers, et al. (1992), in an analysis of a NLSY data, found that those who grew up with more ***reading resources in the home*** had higher levels of schooling, after accounting for background factors. However, Borus and Carpenter (1984) found that having substantial reading material in home was not predictive of college attendance among a sample of high school seniors.

One study found that adolescents from families with lower levels of *parental involvement* were less likely to attend college than those with higher levels of parental involvement (Zaff, et al., 2001). Another study found that p*arental expectations* that their child will attend college was found to be the most strong predictor of college attendance among students across all residence categories in an analysis of High School and Beyond data (Smith, 1995). Another third study found that adolescents whose parents had high educational expectations for them were less likely to drop out of high school (Marsh, 1991b).

Neighborhood/Community/School

A number of neighborhood and school-level factors were examined and found to be significantly related to high school completion.

A large set of neighborhood factors have been found to predict adolescents' educational attainment. One study has documented that the presence of affluent neighbors has stronger effects on likelihood to dropout than does absence of low-income neighbors. Brooks-Gunn, Duncan, Klebanov, and Sealand (1993), using Panel Study of Income Dynamics data, found that the likelihood of dropout among adolescents living in neighborhoods with greater percentages of the low-income families (families with incomes below $10,000) was not significantly different than the likelihood of adolescents from neighborhoods with a greater percentage of moderate income families. However, adolescents living in ***neighborhoods with a greater percentage of affluent families*** (with incomes above $30,000) were less likely to drop out of high school than those who live in neighborhoods with a greater percentage of moderate income families. Brooks-Gunn, et al. also found that White adolescents appear to benefit more than Black adolescents from the presence of affluent neighbors. The study controlled for background variables, including race, family income, and family structure. The study sample included 1,132 Black and 1,214 White females between ages 14 and 19 and the schooling outcome was examined when these women were between the ages of 20 and 25. A second study, also using PSID data, examined the relationship between neighborhoods and schooling among a sample of

1,797 ranging in age from15 to 20 (Halpern-Felsher, Connell, Spencer, et al., 1997). Halpern-Felsher, et al. (1997) found that adolescents with high neighborhood risk composite scores, as indicated by percentage of jobless males, percentage of low SES residents, and low concentration of high-SES residents, completed fewer years of schooling that adolescents with low neighborhood risk scores. They also found that White males and females and Black females living with a greater concentration of high SES neighbors completed more years of schooling than those living in neighborhoods with a lower percentage of high SES neighbors.

Myers, et al. (1992), in an analysis of NLSY data, found that ***the proportion of poor families in the respondent's state*** was associated with lower levels of completed schooling for Blacks. Grogger (1997) examined the effect of ***school violence***, including number of fights and weapons as reported by school principals, on high school graduation using data from nationally representative sample. Adolescents attending schools with moderate levels of violence on were found to be 5.1 percent less likely to graduate than students attending the least violent schools, after controlling for background and school-level variables such as racial composition, school size, class size, school SES, parental education, ever suspended, trouble with law, and prior test scores. Haveman and Wolfe (1995) found that the ***percentage of youth in one's neighborhood that drop out of high school*** predicts the likelihood of graduating from high school, after controlling for a number of background factors.

Residential location is related to adolescents' likelihood to attend college. Urbanicity and region are predictors of college attendance. Smith (1995), in his analysis of High School and Beyond data, found that students living in rural areas were the least likely to attend college and that students living in suburbs were the most likely to attend college. In contrast, Myers, et al. (1992) found that residing in a *rural area* at age 14 predicted increased education among Whites. He also found ***community social capital*** was found to be a significant predictor of college attendance of rural students (Smith, 1995). Smith (1995), in his analysis of High School and Beyond data, found that students living in rural areas were the least likely to attend college and that students living in suburbs were the most likely to attend college. Conversely, Borus and Carpenter (1984) found that high school seniors' residence in rural area or central city was not found to be predictive of attending college. However, they found that seniors from the Northeast ***region*** were less likely than those from the South to attend college.

Numerous school contextual factors are related to students' schooling outcomes. For example, ***school racial composition*** is related to likelihood to attend college. Borus and Carpenter (1984) found that minority high school seniors attending schools in which 10-50% of the student body is minority are more likely to attend college than those in schools with 10% or fewer minorities. These students are moderately more likely to attend college than minority students attending schools with more than 50% minorities. White high school seniors attending schools with less than 10% minority students were marginally more likely to attend college than minority high school seniors attending schools with fewer than 10% minority students. They found that high school seniors who were in schools with student-teacher ratios at or above 15 being marginally less likely than those under 15 to attend college.

McNeal (1995) found that students in the ***academic track*** were less likely to drop out of high school than students in lower tracks, after controlling for background factors.

Tracking placement was also found to be related to increased likelihood of attending college. Similarly, Borus and Carpenter (1984) found that high school seniors in the college prep track were more likely than those in the general track to attend college. No difference was found between college attendance rates of those in the vocational and general tracks.

Evidence on ***school size***, however, is mixed as to its effect on college attendance. Borus and Carpenter (1984) found that high school seniors attending schools with between 1000 to 1749 students to be more likely than those attending schools with over 1749 students to attend college. However, no difference between students attending schools with fewer than 1000 students and schools with over 1749 students. Another study found that adolescents from larger schools were more likely to drop out of high school than those from smaller schools (Marsh, 1991b).

School type has been found to predict schooling outcomes. Neal (1997), using High School and Beyond data, found that ***Catholic school attendance*** is associated with significantly increased levels of educational attainment among urban minorities. Fewer gains of Catholic schooling were found for urban and suburban whites. Research has suggested that school type is related to adolescents' likelihood to attend college. Neal (1997) finds that Catholic schooling significantly increases educational attainment among urban minorities. Fewer gains of Catholic schooling were found for urban and suburban whites. Zaff, et al. (2001) found that adolescents who attend Catholic schools are more likely to attend college than adolescents from public schools, after controlling for individual, demographic, and family processes factors. However, as stated before, it is important to note that studies trying to compare educational outcomes of students who attended Catholic or private schools to students attending public schools may not be able to control for selection factors; that is, unobservable characteristics about motivational levels of parents and adolescents who attend private schools, for which they must pay, may account for some of the effects attributed to Catholic schools.

One study found that teacher characteristics are related to educational attainment for some students. For example, Black students with teachers with at least 10 years of experience were found to have lower dropout rates than students whose teachers had fewer years of experience; however, this relationship was not found for other racial and ethnic groups (Ehrenberg & Brewer, 1994). Hispanic high school students attending schools with a greater percentage of Hispanic teachers had lower dropout rates than Hispanic students attending schools with lower percentages of Hispanic teachers (Ehrenberg & Brewer, 1994).

Two studies demonstrated a negative relationship between ***mobility*** and educational attainment. Ludwig, Duncan, and Ladd (1998) evaluated educational outcomes of an experimental evaluation of the Moving to Opportunities program, a program that randomly assigned housing vouchers to assist families in moving to low poverty areas. Ludwig, et al. (1998) found that adolescents in the experimental group were more likely to repeat a grade, and to subsequently drop out of high school than control group youth, after being offered a voucher to move to a low-poverty neighborhood. This study implies, although it does not indicate decisively, that moving actually led to the decreased levels of educational attainment. Evidence presented from a longitudinal study also suggests that there are negative implications for adolescents who move Haveman and Wolfe (1995) found that the number of household moves

was related to lower levels of high school graduation and fewer number of years of schooling completed, after controlling for a number of background factors.

School mobility during secondary years may have different implications for college attendance than it does for high school completion. Moving between neighborhoods is not found to be a predictor of college attendance, although it was found to a predictor of other educational outcomes covered in this review. Haveman and Wolfe (1995) found that number of household location moves is not significantly related to likelihood of attending college, after controlling for background factors. However, this is only based on one study.

Societal/Policy

One study suggests that policies setting a *minimum age for school dropout* can affect high school dropout as compulsory school attendance policies are predictive of educational attainment. Angrist and Krueger (1991), in an analysis of a national sample using instrumental variables to estimate policy effects, demonstrate that individuals born early in the year start school at an older age and drop out after completing fewer months of schooling than their peers who begin school at later months. They estimate that 25 percent of the potential dropouts complete more schooling because of compulsory schooling policies for students below certain ages.

A second study found that state dropout rates are related to restrictive policies for granting high school equivalency degrees (or GEDs) (Chaplin, 1999). For example, Chaplin found that state requirements of parental permission in order to attain a GED predicts a lower likelihood of dropping out in that state.

Programs that influence high school completion and college attendance

Among a set of ***high quality early childhood intervention programs*** that were experimentally evaluated, only the High/ Scope Perry Preschool was found to increase high school graduation rates (Barnett, 1995; Currie, 2000). For instance, the Early Training Program had no effect on participants' high school graduation rates (Barnett, 1995; Currie, 2000).

In contrast, there is more consistent evidence from experimental studies that that ***mentoring programs*** are able to improve educational attainment, as indicated by college attendance. Program participants of both Project Raise, a program offering mentoring, academic assistance, and recreational activities, and Career Beginnings, a program offering mentoring, academic assistance, and a summer job, were found to be more likely to attend college than control group youth in these two studies (Cave & Quint, 1990; McPartland & Nettles, 1991).

Likewise, some evidence exists that ***youth development programs*** are able to improve high school completion rates. Quantum Opportunities Program (QOP) was targeted towards disadvantaged students in the ninth grade at their time of entry into the program. QOP offered a variety of activities, including tutoring, computer assisted instruction, homework assistance, life/family skills training, college preparation activities, community service participation, and financial incentives. Program participants in the Quantum Opportunities Program were found to be less likely to drop out of high school and more likely to attend post-secondary school one year after the program's end (Hahn, 1994) than control group members.

However, not all youth development programs have had positive effects on adolescents' educational attainment. The programs below, which were all evaluated experimentally, were not found to improve the educational attainment of their adolescent participants in comparison to control group students. For example, graduation rates of program participants in Children at Risk and the Summer Training and Education Program (STEP), and Upward Bound (UB) were not found be significantly higher than those of control group youth (Harrell, Cavanaugh, and Sridharan, 1999; Grossman & Sipe, 1992). Upward Bound participants were not found to be significantly different in high school dropout or overall college attendance rate than control group youth; however some subgroups, namely, Whites, Latinos, more disadvantaged participants, and longer-term participants, were more likely to graduate from high school than control group members from similar backgrounds. UB evaluators caution that these findings are preliminary as the full experimental group was not of age to be included in the educational attainment analyses (Myers & Schrim, 1999).

Vocational or employment-based programs with the goal of improving employability have shown mixed effectiveness in improving educational attainment, as measured by attainment of high school or college credentials (Jekielek, Cochran, & Hair, 2001).

In sum, evidence suggests that attendance in high quality early childhood programs, especially by disadvantaged children and adolescents, mentoring programs, employment programs, and youth development programs may help to increase adolescents' likelihood of graduating from high school and attending college. Yet, not all programs have been successful in improving this outcome for youth.

Summary

In sum, graduating from high school is a major milestone for adolescents and helps them make a successful transition into adulthood. Adolescents who continue their schooling after completing high school, and those who attend any college, have higher levels of economic well-being, social psychological well-being and health, on average, than those who do not complete high school. In this review of the literature on the antecedents of educational attainment, individual, family, peer, neighborhood, school, community, and societal, environmental factors were all found to predict adolescents' likelihood to complete high school and to attend and complete college.

A number of individual-level factors, including gender, race, age, ability, activities, employment, psychosocial factors have all been found to predict adolescents' levels of educational attainment. For instance, after controlling for various background factors and prior achievement levels, Blacks, and sometimes Asian Pacific/Islanders and Latinos, are found to have higher educational attainment levels than are Whites, although Blacks and Latinos have lower levels of educational attainment than Whites without these background factors controlled. Evidence is mixed regarding the effects of gender; yet, much of the research shows that females are more likely to graduate from high school and to attend college than males. Further, adolescents with high levels of ability and those who had higher levels of achievement throughout high school are more likely to graduate from high school and to attend and complete college than adolescents with lower levels of ability or lower levels of prior achievement.

Adolescents' psychosocial well-being also appears to be related their educational attainment. For example, adolescents with higher levels of school engagement, higher levels of self-esteem and academic self-concept, more internal locus of control, and higher educational expectations were all found to hold higher levels of educational attainment.

Likewise, adolescents' behavior outside of the school context has implications for their educational attainment. Adolescents who are rebellious, aggressive, and who participate in delinquent behavior, use drugs and alcohols, and get pregnant at early ages, among other health risk factors, were found to be less likely to graduate from high school. Yet, these health risk factors were not consistently related to their likelihood to attend college. However, having a child by age 22 was associated with decreased likelihood of college completion by age 30.

Finally, adolescents' use of their out-of-school time is related to their levels of educational attainment. For example, those who participate in extracurricular activities are more likely to graduate from high school and to attend college attendance than those who do not. Likewise, research on the effects of adolescent employment has clearly documented that adolescents who work long hours during the school year, often defined as 20 hours per week or more, are less likely to graduate from high school and to attend college. Yet, the implications of other forms of employment, such as employment during the summer months, are not as clear.

Research has shown that adolescents' peer relationships are related to their educational attainment outcomes. For example, antisocial adolescents who were rejected by their peers were found to be more likely to drop out of high school. Further, adolescents who spent their middle school years socializing with people who had dropped out of high school were more likely to drop out themselves. Finally, the academic orientation of adolescents' peers, such as how positively or negatively oriented they are, has implications for their likelihood of attending college.

A large number of family-level factors have also been found to predict adolescents' likelihood of graduating from high school. For instance, a family's socioeconomic status, levels of parental education, income, public assistance receipt, family structure and size, all have implications for adolescents' likelihood of graduation from college. Parents' involvement with their adolescents and other parental characteristics have also been identified in the research.

A number of family economic characteristics have been demonstrated to predict adolescents' levels of educational attainment. For instance, the socioeconomic status (SES) of adolescents' families, as indicated by their levels of family income and parental education, is associated with their likelihood to complete high school, with adolescents whose families have higher income or whose parents have higher levels of education more likely to complete high school and complete college. The link between public assistance receipt and adolescents' educational attainment is less consistent in the research, although one study found that among poor adolescents, public assistance receipt was associated with higher levels of educational attainment.

Evidence on the effects of family structure and on adolescents' educational attainment is mixed, as are findings on the effects of family composition, such as family size, on college attendance. However, a number of studies suggest that adolescents living with two biological

parents have higher levels of educational attainment, on average, than adolescents from single-headed families or step-families. Further, some studies have suggested that having a greater number of siblings and being born later in the birth order of the family are both related to a decreased likelihood of graduating from high school, although many studies have shown no relationship between an adolescent's number of siblings and his or her likelihood of attending college.

A number of neighborhood factors have been found to predict adolescents' levels of educational attainment. For instance, adolescents' who live in a neighborhood with a higher percentage of youth who drop out of high school have a lower likelihood of graduating from high school themselves than those living in neighborhoods with a lower percentage of youth who've dropped out. Likewise, a negative relationship appears to exist between mobility between schools and/or neighborhoods and high school completion, with adolescents whose families move more often less likely to graduate than those who move less frequently.

Further, characteristics of adolescents' schools have implications for their levels of attainment. For instance, adolescents who attend schools with moderate levels of violence were found to be less likely to graduate than students attending schools that were less violent. Likewise, the average income of families in an adolescent's school is related to their likelihood of graduating from high school, with those in schools with higher average family incomes being more likely to graduate from school than those from schools in which the students are less economically well-off. A relationship has also been found between adolescents' track in their school and their likelihood of completing high school, with those in the academic track less likely to drop out of high school than students in lower tracks. School policies regarding the minimum age at which students can drop out of school also seem to have implications for high school dropout rates, with students who are legally able to drop out at an earlier age being more likely to do so. Likewise, school types vary in their effectiveness in improving schooling outcomes. Adolescents who attend Catholic schools are more likely to graduate from high school and to attend college than adolescents from comprehensive public schools, although the research on this topic is far from definitive.

Finally, adolescents' attendance in intervention programs can be effective in improving their educational attainment; however, as many studies find no relationship between participation in programs and attainment, it appears that only certain programs are able to alter this outcome. Adolescents who participated in certain high quality early childhood program had lower high school dropout rates and higher high school graduation rates than those who did not participate in such programs. Likewise, some evidence exists that youth development programs are able to improve high school completion rates, although programs vary widely in their effectiveness in improving attainment. Evidence also shows that participation in intervention programs can increase adolescents' likelihood of attending college, although the findings from evaluations examining this outcome are somewhat mixed. The most promising evidence of success in improving adolescents' educational attainment levels comes from mentoring programs with strong case management that offer academic assistance.

Summary of antecedents of academic indicators of educational adjustment

Many of the antecedents of academic achievement and educational attainment overlap, a fact that is perhaps not surprising given the relationship between these indicators of educational adjustment. Given this amount of overlap, however, it is useful to document which of these antecedents are found to predict both of these outcomes. In this summary, the major antecedents found to be important predictors for both of these indicators of educational adjustment will be discussed. Please note that the order of the antecedents is not related to its degree of strength in predicting a given outcome. Also, as is true with the summary of antecedents of psychological indicators of educational adjustment, the fact that a given antecedent has only been found to predict one outcome and not the other does not necessarily indicate that it is less important. In contrast, a predictor may strongly predict academic achievement, for example, but not be predictive of educational attainment. Further, some predictors have been examined for only one of these two sets of outcomes. Hence, as with the summary for the psychological indicators of educational adjustment, this section should be read with caution.

Individual-level antecedents

A number of individual-level antecedents of academic achievement and educational attainment overlap. These include adolescents' characteristics such as their race; their gender; their ability levels and levels of prior achievement; their psychological adjustment to school; and their participation in out-of-school activities, such as their employment and extracurricular activity participation.

First, research suggests that adolescents' race, gender, and ability and prior achievement are common predictors of academic achievement and educational attainment. The relationship between race and ethnic background and achievement is the converse to that of educational attainment. In particular, Blacks and Hispanics are found to have lower achievement levels, on average, than Whites and Asian Pacific Islanders; however, Blacks and Hispanics are found to have higher levels of high school graduation and college attendance, on average, than Whites. A similar pattern is found with gender. While females have higher grades, on average, than males, they are found to perform worse than males, on average, on math and science tests. However, some studies have found females to be more likely to graduate from high school and to attend college than males. Finally, adolescents' prior achievement and early levels of ability, as indicated by their IQ and cognitive test scores, were often found to be the strongest predictors of students' academic achievement and their educational attainment. Studies have also shown that higher levels of school engagement and higher educational expectations predict higher levels of academic achievement as well as higher levels of educational attainment.

Adolescents' activities, such as the amount of hours they are employed and their extracurricular participation, were found to predict both adolescents' academic achievement and educational attainment. More intense employment during the adolescent years (including working a greater numbers of hours) has been found to relate to lower levels of academic achievement and educational attainment. Conversely, extracurricular participation was associated with higher levels of achievement and with higher levels of educational attainment.

Family-level antecedents

Fewer overlapping predictors of academic achievement and educational attainment emerged in the review of the literature on family-level antecedents. The family-level predictors

found to predict both educational attainment and academic achievement included socioeconomic status, family structure and composition, and parental involvement.

The socioeconomic status of adolescents' families was a predictor of both academic achievement and educational attainment. Adolescents from families with higher levels of socioeconomic status, as indicated by higher levels of parental education, more prestige parental occupations, and higher family income, were consistently related to higher levels of academic achievement and educational attainment than adolescents from families with lower levels of socioeconomic status. Further, adolescents who live in a two-parent biological family were found to have higher levels of academic achievement and educational attainment, on average, than adolescents living in a single-parent family.

Family structure and family composition have also been related to both academic achievement and educational attainment. Living in a two-parent biological family was related to higher levels of academic achievement and educational attainment, on average, than living in a single-parent family or stepfamily. Living in a larger family also appears to have negative implications for adolescents' educational attainment and achievement outcomes. Specifically, adolescents from larger families have lower levels of achievement, on average, and are less likely to graduate from high school than those from smaller families.

Finally, parents' levels of involvement in their adolescents' lives was found to be important for adolescents' academic achievement and educational attainment, although different forms of involvement appear to be more influential than others. More research is certainly needed to further investigate the possibility that some forms of parental involvement are less beneficial or even harmful for students.

Peer-level antecedents

There is a relative dearth of research on the antecedents of adolescents' academic achievement and educational attainment outcomes. The few studies that have been completed suggest that adolescents' peers can have some influence on their educational outcomes.

The literature that has examined this relationship has fairly consistently suggested that the educational functioning of adolescents' peers has implications for their own educational attainment. For instance, adolescents who spend a greater amount of time with friends have lower achievement levels, on average, than adolescents who spend less time with friends. Likewise, Adolescents whose peers have higher dropout rates were more likely to drop out of high school themselves. Antisocial adolescents who were rejected by peers also had higher dropout rates than their peers who were better socially adjusted. Finally, the orientation of adolescents' peer group is also related to their own likelihood of attending college. However, it is clear that more research is needed to determine definitively the implications of adolescents' peer group for their own academic achievement and attainment.

Neighborhood/Community/School-level

A number of studies have identified key characteristics of adolescents' school environments that are related to their likelihood to achieve academically and to attain higher

levels of education. However, only a few variables have been found to predict both adolescents' achievement and their educational attainment; namely, school mobility and tracking.

The number of moves between neighborhoods and/or schools that adolescents experience is related to their levels of achievement and their likelihood of dropping out of high school, with those who move more frequently experiencing lower levels of achievement and a greater likelihood of dropping out. Further, placement in an academic track at school is associated with higher levels of achievement and increased levels of high school graduation and college attendance than placement in a less academic track.

SOCIETAL LEVEL FACTOR: EDUCATION POLICIES/REFORMS

Programs that have been documented to increase adolescents' academic adjustment to school and educational attainment

Rigorous research on programs is relatively scant. However, programs that have been experimentally evaluated show that early childhood programs, youth development programs, and mentoring programs can be effective in improving adolescents' academic achievement during their secondary school years and in improving their subsequent educational attainment. Specifically, participation in early childhood programs, mentoring programs, and youth development programs seems to offer to greatest potential for influencing multiple aspects of adolescents' academic achievement and attainment levels. Yet, the effectiveness of these programs varies by their type and the specific educational outcome of interest. For instance, vocational or employment-based programs with the goal of improving employability have shown effectiveness in improving educational outcomes such as school attendance and academic course-taking, but have shown less effectiveness in improving adolescents' academic outcomes such as achievement (Jekielek, Cochran, and Hair, 2001). Early childhood programs have more often been demonstrated to increase adolescents' academic achievement than to influence their levels of educational attainment. Further, academically-focused youth development programs seem to more successful in improving achievement, whereas the Quantum Opportunities Program had a greater influence on educational attainment. Mentoring programs providing academic assistance, such as Project RAISE and Career, have also been found to positively impact educational attainment. Another high quality mentoring program, Big Brothers/Big Sisters was effective in improving grades among their participants.

Common Themes and Overall Conclusions

Adolescence is a period during which young people are preparing for adulthood. Those who have higher levels of educational adjustment are more prepared to make this transition a successful one.

This document reviewed a number examining the relationship between adolescents' experiences and their educational adjustment. It provided evidence of indicators at the individual-, family-, peer-, and school- and neighborhood-levels that have implications for adolescents' levels of educational adjustment.

A number of studies have documented the relationship between adolescents' individual characteristics and their educational adjustment. Adolescents' ability, prior achievement, race, age, and gender are related to their educational outcomes. For example, some studies have found that females have higher levels of school engagement and school grades and graduation rates than males, but have found that they have lower levels of performance on math and science standardized achievement tests. Other studies have found that adolescents who were held back in school were more likely to drop out of high school than adolescents who steadily advanced through school each year. Programs may use these characteristics to identify and target youth who are at higher educational risk.

A number of psychological indicators of educational adjustment have also been found to predict students' academic achievement and educational attainment outcomes. Adolescents who are motivated to achieve, and who have high academic self-concepts, high levels of school engagement, and high educational expectations are more likely to achieve in the educational domain. Programs may be able to positively influence these psychological indicators of educational well-being if program staff support and encourage students, communicating their beliefs in the students' ability to achieve academically and attempting to increase adolescents' interest in and motivation toward school.

Further, the choices that adolescents make in their use of non-school time have implications for their educational outcomes. For example adolescents who participate in extracurricular activities are more likely to have higher levels of academic achievement and higher levels of educational attainment. Adolescents who participate in extensive amounts of employment during the school year have educational outcomes than those who work fewer weekly hours and those who do not work. Some research suggests that there are positive implications for some types of labor force participation, such as participation during the summer months. Programs may wish to discourage students from participating in extensive employment during the school year, perhaps providing alternative mechanisms for youth from low-income families to assist with family finances if that is the purpose of their employment (e.g., by providing financial incentives for attending and achieving at school).

As would be expected, family background factors are quite important in predicting adolescents' educational adjustment. Research has consistently found that adolescents' socioeconomic status is related to their educational outcomes. Numerous studies have shown that adolescents whose families have higher incomes and whose parents are better-educated and

in higher status occupations are more likely to be psychologically well-adjusted to school and to have higher levels of academic achievement and educational attainment than adolescents from lower income families or with lower-educated families. Hence, programs might aim to increase the socioeconomic status of adolescents' parents, either by providing the family with mechanisms for increasing their income or by encouraging parents to attain higher levels of education.

The few studies on the peer relationships and adolescents' educational adjustment have suggested that peers are able to affect children in negative or positive ways, depending on their academic and behavioral orientation. It is difficult to know if adolescents choose friends with similar attributes or if the friends that adolescents choose influence their behaviors and attitudes. Associating with high-achieving peers who have positive attitudes toward school appears to have positive implications for students' likelihood to do so themselves. Likewise, some evidence shows that adolescents who spend large amounts of time with peers in unsupervised settings are more likely to have lower academic outcomes. Hence, encouraging adolescents to associate with other adolescents who have prosocial norms and behaviors may help to protect them from failing academically. It is important for adolescents to have access to positive or prosocial environments and prosocial, productive peers.

Parents' involvement in their adolescents' lives also has implications for their adolescents' academic adjustment. For instance, adolescents whose parents are more involved in their lives have higher levels of educational adjustment than those whose parents are less involved. However, different forms of involvement appear to matter more than others. Research suggests that adolescents who have parents who communicate to them their interest in their well-being, and their high expectations for them in the educational realm have better educational outcomes, such as improved school engagement, achievement, and attainment.

There is also evidence that the structure of an adolescent's family has implications for his or her academic adjustment. Although some of the evidence of the effects of family structure is mixed, it is clear that adolescents who are not raised with both biological parents have lower levels of educational adjustment than those that are. Hence, programs aimed at decreasing the risk of marital disruption, such as by providing marital counseling to couples interested in making their marriage succeed, may have beneficial implications for the educational adjustment of their children. Further, programs aimed at addressing some of the key factors that may account for lower achievement among adolescents from these families (such as lower levels of parental supervision or time, lower economic well-being or poorer parental mental health) may have positive implications for adolescents. Hence, programs that provide activities and supervision for adolescents during non-school hours or programs that increase families' economic well-being (such as through greater provision of child support) may help reduce the educational difficulties experienced by adolescents from single parent families.

With regard to the important school-level factors in adolescents' lives, it is clear from the research that teacher quality plays a key role in affecting students' educational outcomes. Even in the secondary school years, teachers need to encourage students and communicate their interest in and support for students, as well as their belief in students' ability to succeed. Furthermore, it is important that skilled teachers be hired and retained in the school system. Evidence shows that teachers' education credentials, such as certification and higher level

degrees, do not translate into teaching skills. Yet, studies have been more consistent in showing that adolescents whose teachers hold specific content area knowledge, especially in the subjects of math and science, achieve more in their classes in these subjects. However, more research in this area is needed before definitive conclusions can be drawn.

Research on tracking demonstrates that students who are in classrooms with high achieving peers achieve more, even after controlling for base achievement levels. Similarly, students who are in lower level tracks seem to achieve at lower levels than those in academic tracks, after controlling for base achievement levels. Encouraging adolescents to take higher or academic-level, college preparatory courses may improve adolescent outcomes. Schools with more fluid tracking systems appear to be more effective in improving student learning.

More research is necessary to understand the effects of educational reform efforts and policies, such as standards based reform, school uniforms, and school choice, on adolescents' outcomes. As stated earlier in this report, much of the research that has been conducted has not met our criteria for inclusion, so the effects of such programs and policies are not clearly or fully understood. Therefore, we are not able to make any recommendations regarding educational reforms and policies.

It is clear that some community-based programs are effective in improving adolescent outcomes. For instance, high quality early childcare programs have been effective in improving academic and educational attainment outcomes, although programs vary in how long the program effects on participants last. Likewise, high quality mentoring programs with intensive case management by program staff, and mentors who are dedicated to establishing long-term relationships with their assigned mentees have been more consistently effective in improving adolescents' educational adjustment, achievement, and schooling. Youth development programs with academic components, parental involvement components, as well as social support programming have also been effective in improving adolescents' educational adjustment and schooling, although effectiveness has varied by program and by outcome and level of implementation. Vocational programs or programs with work component, on the other hand, have had mixed effectiveness in improving adolescents' academic outcomes, especially programs that are heavily focused on preparing youth for the transition to the workforce. Program effectiveness varies by program and by outcome. Programs in all these different categories are found to be more effective for disadvantaged youth who are at increased risk for academic failure.

Conclusions

In sum, adolescents' successful educational adjustment is important for them to make a successful transition to adulthood. While more high-quality research is certainly needed to provide definitive answers regarding which factors are most important in predicting adolescents' educational adjustment, a number of factors have been demonstrated to have implications for these outcomes. Individual characteristics and involvement in out-of-school activities, peers, family background, neighborhoods, schools, and some larger societal factors all predict adolescents' educational outcomes. Programs and policies are *able* to affect adolescents' outcomes, although it is likely that these effects will not solve all of adolescents' educational difficulties, given the multitude of factors that affect their lives. Programs wishing to improve

these outcomes may be able to model themselves after those that have shown to be more effective. Programs that can help to influence adolescents' choices about friends, activities, and behaviors may be able to affect these and other developmental outcomes, which are interrelated. Further, programs that support and nurture adolescents' interests and encourage their psychological well-being may also help to improve these outcomes. Supporting policies and programs that are researched-based and well-implemented may prove to positively affect adolescents' educational outcomes.

References

Abbey, A., Pilgrim, C., Hendrickson, P., & Buresh, S. (2000) Evaluation of a Family-Based Substance Abuse Prevention Program Targeted For the Middle School Years. Journal of Drug Education. 30(2) 213-228.

The Abell Foundation. (2001). Teacher certification reconsidered: Stumbling for quality. Baltimore, MD: Author.

Adelman, C. (1999). Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment. Washington, DC: Office of Education Research and Improvement, U.S. Department of Education.

Allen, J., Philliber, S., Herrling, S., & Kuperminc, G. (1997). Preventing teen pregnancy and academic failure: Experimental evaluation of a developmentally-based approach. Child Development, 68, 729-742.

Ames, C. (1992). Classrooms: Goals, structures, and students motivation. Journal of Educational Psychology, 84, 261-271.

Anderman, E.M., Maehr, M.L., & Midgley, C. (1999). Declining motivation after the transition to middle school: Schools can make a difference. Journal of Research and Development in Education, 32, 131-147.

Anderman, L.H. (1999). Classroom goal orientation, school belonging, and social goals as predictors of students' positive and negative affect following the transition to middle school. Journal of Research and Development in Education, 32, 89-103.

Anderman, L.H., & Anderman, E.M. (1999). Social predictors of changes in students' achievement goal orientations. Contemporary Educational Psychology, 25, 21-37.

Angrist, J. & Krueger, A. (1991). Does compulsory school attendance affect schooling and earnings? Quarterly Journal of Economics, 106(4), 979-1014.

Argys, L.M., Rees, D.I., & Brewer, D.J. Detracking America's Schools: Equity at Zero Cost? Journal of Policy Analysis and Management, 15(4), 623-645.

Astone, N.M., & McLanahan, S.S. (1991). Family structure, parental practices and high school completion. American Sociological Review, 56(3), 309-320.

Axinn, Duncan, & Thornton. (1997). The Effects of Parents' Income, Wealth, and Attitudes on Children's Completed schooling and Self-Esteem. Chapter 16 in Duncan, G. & Brooks-Gunn, J., eds. Consequences of Growing up Poor. New York: Russell Sage Foundation.

Ballou, D. (1996). Do public schools hire the best applicants? The Quarterly Journal of Economics, 111(1): 97-133.

Barnett, S.W. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. The Future of Children, 5(3), 25-50.

Battle, J. (1998). What beats having two parents? Journal of Black Studies, 28(6), 19p.

Berends, M. (1995). Educational stratification and students' social bonding to school. British Journal of Sociology of Education, 16, 327-351.

Bishop, J.H. (2000). Curriculum-Based External Exit Systems: Do students learn more? How? Psychology, Public Policy, and Law, 6, 199-215.

Blau, F. & Kahn, L. (2000). Do cognitive test scores explain US wage inequality? NBER Working Paper No.8210. Cambridge, MA: National Bureau of Economic Research.

Boisjoly, J., Harris, K & Duncan, G. (1998). Trends, events, and Duration of Initial Welfare Spells. Social Service Review, December 1998, 466-492.

Borus, M.E., & Carpenter, S.A. (1984). Factors associated with college attendance of high school seniors. Economics of Education Review, 3, 169-176.

Bracey, G.E. (1998). An optimal size for high schools? Research. Phi Delta Kappan, 79(4), 406.
Brook, J. & Newcomb, M.D, (1995). Childhood Aggression and Unconventionality: Impact on Later Academic Achievement, Drug Use, and Workforce Involvement. The Journal of Genetic Psychology, 156, 393-410.
Brooks-Gunn, J. & Duncan, G.J. (1997). The effects of poverty on children. The Future of Children, 7(2), 55-71.
Brooks-Gunn, J., Duncan, G.J., Klebanov, P.K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development? American Journal of Sociology, 99(2), 353-395.
Cairns, R.B., Cairns, B.D., & Neckerman, H.J. (1989). Early school dropout: Configurations and determinants. Child Development, 60, 1437-1452.
Card, D. & Krueger, A. (1996). School resources and student outcomes: An overview of the literature and new evidence from North and South Carolina. Journal of Economic Perspectives, 10, 31-50.
Catsambis, S. (1998). Expanding knowledge of parental involvement in secondary education: Effects on high school academic success. Report No. 27. Washington, DC?: Center for Research on the Education of Students Placed At Risk.
Cave, George, & Quint, Janet. (1990). Career beginnings impact evaluations: Findings from a program for disadvantaged high school students. New York: Manpower Demonstration Research Corporation.
Chaplin, D. (1999). GEDs for teenagers: Are there unintended consequences? Washington, DC: The Urban Institute.
Chaplin, D. & Hannaway, J. High school employment: Meaningful connections for at-risk youth. Washington, DC: The Urban Institute.
Chirkov, V.I., & Ryan, R.M. (2001). Parent and teacher autonomy-support in Russian and U.S. adolescents: Common effects on well-being and academic motivation. Journal of Cross-Cultural Psychology, *32*, 618-635.
Collins, P. A., Wright, J. C., Anderson, D. R., Huston, A. C., Schmitt, K. L., & McElroy, E. S. (1997). Effects of early childhood media use on adolescent achievement. In J. C. Wright (Chair), The long-term effects of television viewing. Symposium sat the biennial meeting of the Society for research in Child Development, Washington, DC.
Conger, Conger, & Elder. (1997) Family Economic Hardship and Adolescent Adjustment: Mediating and Moderating Processes. Chapter 10 in Duncan, G. & Brooks-Gunn, J., eds. Consequences of Growing up Poor. New York: Russell Sage Foundation.
Connell, J. P., Halpern-Felsher, B. L., Clifford, E., Crinchlow, W., & Usinger, P. (1995). Hanging in there: Behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high school. Journal of Adolescent Research, 10, 41-63.
Connell, J.P., & Halpern-Felsher, B.L. (1997). How neighborhood affect educational outcomes in middle childhood and adolescence: Conceptual issues and an empirical example. In Brooks-Gunn, J., Duncan, G.J., & Aber, J.L. (Eds.), Neighborhood poverty: Context and consequences for children (pgs. 174-199). New York: Russell Sage.
Connell, J.P., Spencer, M.B., & Aber, J.L. (1994). Educational risk and resilience in African-American youth: Context, self-action, and outcomes in school. Child Development, 65, 493-506.

Cotton, K. (1996). School size, school climate, and student performance. School Improvement Research Series. Close-up #20. Portland, OR: Northwest Regional Educational Laboratory.

Crane, J. (1991). The epidemic theory of ghettos and neighborhood effects on dropping out and teenage childbearing. American Journal Sociology, 96(5), 1226-59.

Currie, J. (2000). Early childhood intervention programs: What do we know? Working Paper. Chicago, IL: Joint Center for Poverty Research, Northwestern University and the University of Chicago.

Currie, J. & Thomas, D. (1999). The inter-generational transmission of intelligence: Down the slippery slopes of the Bell Curve." Industrial Relations, 38(3), 297-330.

D'Amico, R. (1984). Does employment during high school impair academic progress? Sociology of Education, 57(3), 152-164.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. Education Policy Analysis Archives, 8(1). Available on-line: http://epaa.asu.edu/epaa/v8n1.

Darling-Hammond, L., Berry, B., & Thoreson, A. (2001). Educational Evaluation and Policy Analysis, Spring 2001, Vol. 23, No. 1, pp. 57–77

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11, 227-268.

Dee, T. (2001). Teachers, race, and student achievement in a randomized experiment. New York: NBER Working Paper No. W8432.

Dee, T.S. & Evans, W.N. (1999). State alcohol policies, teen drinking and traffic fatalities, Journal of Public Economics, 72(2), 289-315.

Downey, D.B. (1995). When bigger is not better: Family size, parental resources, and children's educational performance. American Sociological Review, 60(5), 746-761.

Downey, D.B. (1995). When bigger is not better: Family size, parental resources, and children's educational performance. American Sociological Review, 60, 746-761.

Druva, C. & Anderson, R. (1983). Science teacher characteristics by teacher behavior and by student outcome: A meta-analysis of research. Journal of Research in Science Teaching, 20(5), 467-479.

Dynarksi, M. & Gleason, P. (1998). How can we help? What we have learned from evaluations of federal dropout-prevention programs. Prepared for the Planning and Evaluation Service, U.S. Department of Education. Princeton, NJ: Mathematica Policy Research;

Eccles, J.S., & Barber, B.L. Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? Journal of Adolescent Research, 14(1), 10-43.

Ehrenberg, R.G. & Brewer, D. (1994). Do school and teacher characteristics matter? Evidence from High School and Beyond. Economics of Education Review, 13(1): 1-17.

Ehrenberg, R.G., Goldhaber, D.D., & Brewer, D.J. (1995). Do teachers' race, gender, and ethnicity matter? Evidence from the National Educational Longitudinal Study of 1988. Industrial and Labor Relations Review, 48(3), 547-61.

Elbaum, B. & Vaughn, S. (2001). School-based interventions to enhance the self-concept of students with learning disabilities: A meta-analysis. The Elementary School Journal, 101, 304-329.

Entswisle, D. R. (1990). Schools and the Adolescent. Chapter 8. In S. Feldman & G. Elliott,

(Eds.) At the Threshold: The Developing Adolescent. Cambridge: Harvard University Press.
Entswisle, D.R., Alexander, K.L., & Olson, L.S. (1994). The gender gap in math: Its possible origins in neighborhood effects. American Sociological Review, 59, 822-838.
Evans, W.N. & Montgomery, E. Education and health: Where there's smoke there's an instrument. NBER Working Paper No. W4949.
Farkas, G., Olsen, R., Stromsdorfer, E., Sharpe, L., Skidmore, F., Smith, D., Merrill, S. (1984). Post-program impacts of the youth incentive entitlement pilot projects. New York: Manpower Demonstration Research Corporation.
Fashola, O.S. & Slavin, R.E. (1997). Effective dropout prevention and college attendance programs for Latino students. Prepared for the Hispanic Dropout Project. [On-line] Available: http://www.ncbe.gwu.edu/miscpubs/hdp/4/index.htm.
Fashola, O.S. & Slavin, R.E. (1998). Schoolwide reform models: What works? Phi Delta Kappan, 79(5). [On-line] Available: http://www.pdkintl.org/kappan/ksla9801.htm.
Felgin, N. (1995). Factors contributing to the academic excellence of American Jewish and Asian students. Sociology of Education, 68, 18-30.
Ferguson, R. (1991). Paying for public education: New evidence on how and why money matters. Harvard Journal on Legislation, 28(2), 465-498.
Figlio, D.N. (1999). Functional form and the estimated effects of school resources. Economics of Education Review, 18(2), 241-52.
Finn, J., & Achilles, C. (1990). Answers and questions about class size: A statewide experiment. American Educational Research Journal, 27(3), 557-77.
Finn, J.D., & Rock, D.A. (1997). Academic success among students at risk for school failure. Journal of Applied Psychology, 82, 221-234.
Finn, J.D., & Voelkl, K.E. (1993). School characteristics related to student engagement. Journal of Negro Education, 62, 249-268.
French, D.C., & Conrad, J. (2001) School dropout as predicted by peer rejection and antisocial behavior. Journal of Research on Adolescence. 11(3) 225-244.
Gamoran, A., Nystrand, M., Berends, M., and LePore, P.C. (1995). An organizational analysis of the effects of ability grouping. American Educational Research Journal, 32, 687-715.
Gamoran, A. (1992). The variable effects of high school tracking. American Sociological Review, 57(6), 812-828.
Gamoran, A. (1996). Student achievement in public magnet, public comprehensive, and private city high schools. Educational Evaluation and Policy Analysis, 18(1), 1-18.
Garnier, H.E., Stein, J.A., & Jacobs, J.K. The process of dropping out of high school: A 19-Year perspective. American Educational Research Journal, 34(2), 395-419.
Gill, B., Tempane, M., Ross, K., & Brewer, D. (2001). Rhetoric versus reality: What we know and what we need to know about vouchers and charter schools. Santa Monica, CA: RAND.
Glasgow, K.L., Dornbusch, S.M., Troyer, L., Steinberg, L., & Ritter, P.L. (1997). Parenting styles adolescents' attributions, and educational outcomes in nine heterogeneous high schools. Child Development, 68, 507-529.
Goldhaber, D. (1996). Public and private high schools: Is school choice an answer to the productivity problem? Economics of Education Review, 15(2), 93-109.
Goldhaber, D. & Brewer, D. (1997). Why don't schools and teachers seem to matter? Assessing the impact of unobservables on educational productivity. The Journal of Human Resources, 32(3), 505-523.

Gortmaker, S.L., Salter, C.A., Walker, D.K., & Dietz, W.H. (1990). The impact of television viewing on mental aptitude and achievement: A longitudinal study. Public Opinion Quarterly, 54, 594-604.

Gottfredson, D.C., Fink, C.M., & Graham, N. (1994). Grade retention and problem behavior. American Educational Research Journal, 31, 761-784.

Gottfried, A., Fleming, J. and Gottfried, A. (1998) Role of Cognitively Stimulating Home Environment in Children's Academic Intrinsic Motivation: A Longitudinal Study. Child Development. Vol.69, 1448-1460.

Gottschalk, P., McLanahan S., & Sandefur G. D. (1994). The dynamics and intergenerational transmission of poverty and welfare participation. Chapter 4. In S. Danziger, G. Sandefur & D. Weinberg (Eds.), Confronting poverty: prescriptions for change. New York: Russell Sage Foundation.

Goyette, K., & Xie, Y. (1999). Educational expectations of Asian American youth: Determinants and ethnic differences. Sociology of Education, 72, 22-36.

Greenwald, R., Hedges, L.V., & Laine, R. (1996a).The effect of school resources on student achievement. Review of Educational Research, 66(3), 361-96.

Greenwald, R., Hedges, L.V., & Laine, R. (1996b). Interpreting research on school resources and student achievement: A rejoinder to Hanushek. Review of Educational Research, 66(3), 411-16.

Grogger, J. (1997). Local violence and educational attainment. Journal of Human Resources, 32(4), 659-82.

Grolnick, W.S., Ryan R.M., & Deci, E.L. (1991). The inner resources for school achievement: Motivational mediators of children's perceptions of their parents. Journal of Educational Psychology, 83, 508-517.

Grossman, J.B., & Sipe, C.L. (Winter 1992). Summer Training And Education Program (STEP) Report on Long-Term Impacts. Philadelphia: Public/Private Ventures.

Guo, Guang. (1998). The timing and influences of cumulative poverty on children's cognitive ability and achievement. Social Forces, 77(1), 257-287.

Gutman, L.M. & Eccles, J.S. (1999). Financial strain, parenting behaviors, and adolescents' achievement: Testing model equivalence between African American and European American single- and two-parent families. Child Development, 70(6), 1464-1476.

Hahn, A. (1994). Extending the time of learning. In D.J. Besharov (Ed.) America's Disconnected Youth: Toward a Preventative Strategy (pp.233-266). Washington, DC: CWLA Press and American Enterprise Institute for Public Policy Research.

Hallinan, M.T., & Williams, R.A. (1990). Students' characteristics and the peer-influence process. Sociology of Education, 63, 122-132.

Hanson,T.L. (1999). Does parental conflict explain why divorce is negatively associated with child welfare? Social Forces, 77(4), 1283-(32pp).

Hanushek, E. (1997). Assessing the effects of school resources on student performance: An update. Educational Evaluation and Policy Analysis, 19(2), 141-64.

Hanushek, E. Kain, J.F. & Rivkin, S.G. (1998). Teachers, schools, and academic achievement. NBER Working Paper No. W6691.

Hanushek, E.A. (1986). The economics of schooling: Production and efficiency in public schools. Journal of Economic Literature, 24, 1141-1177.

Hanushek, E. (1989). The impact of differential expenditures on school performance. Educational Researcher, 18(4), 45-51.

Hanushek, E.A. (1992). The trade-off between child quantity and quality. Journal of

Political Economy, 100(1), 84-117.
Hanushek, E.A. (1996). A more complete picture of school resource policies. Review of Educational Research, 66(3), 397-409.
Hanushek, E. (1997). Assessing the effects of school resources on student performance: An update. Educational Evaluation and Policy Analysis, 19(2), 141-64.
Hanushek, E. (1998). The evidence on class size. Occasional paper number 98-1. W. Allen Wallis Institute of Political Economy, University of Rochester, February.
Harrell, A., Cavanaugh, S., & Sridharan, S. (1999). Evaluation of the Children at Risk Program: Results 1 year after the end of the program. Research in brief. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.
Harter, S., Runbaugh, Whitesell, N., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescent's perceptions of competence and motivational orientation. American Educational Research Journal, 29, 777-807.
Haveman, R., & Wolfe, B. (1994). Succeeding Generations: On the Effects of Investments in Children. New York: Russell Sage Foundation.
Haveman, R., & Wolfe, B. (1995). The determinants of children's attainments: A review of methods and findings. Journal of Economic Literature, 32, 1829-1878.
Hawkins, J.D., Catalano, R.F., Kosterman, R., Abbott, R., & Hill, K.G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. Archives of Pediatric and Adolescent Medicine, 153, 226-234.
Hay, I., Ashman, A.F., van Kraayenoord, C.E., & Stewart, A.L. (1999). Identification of self-verification in the formation of children's academic self-concept. Journal of Educational Psychology, 91, 225-229.
Heath, A.C., Berg, K, Eaves, L.J., Solaas, M.H., Corey, L.A., Sundet, J., Magnus, P., & Nance, W.E. (1985). Education policy and the heritability of educational attainment. Nature, 314, 35, 734-736.
Henderson, V.L. & Dweck, C.S. (1990). Motivation and achievement. In S.S. Feldman & G.R. Elliott (Eds.), At the threshold: The developing adolescent (pp. 308-330). Cambridge, MA: Harvard University Press.
Herman, R., Aladjam, D., McMahon, P., Masem, E., Mulligan, I., Smith, O., O'Malley, A., Quinones, S., Reeve, A., & Woodruff, D. (1999). An educator's guide to schoolwide reform. What we know about comprehensive school reform models. Report for the U.S. Department of Education, Office of the Under Secretary of Education, Planning and Evaluation Service, American Institutes for Research, Washington, DC.
Holmes, C.T., & Matthews, K.M. (1984). The effects of nonpromotion on elementary and junior high school pupils. Review of Educational Research, 54, 225-236.
Howell, W.G., Wolf, P.J., Peterson, P.E., & Campbell, D.E. (2000). Test-score effects of school vouchers in Dayton, OH, New York City, and Washington, D.C.: Evidence from randomized field trials. Paper prepared for the annual meetings of the American Political Science Association, Washington, D.C., September. Cambridge, MA: Program on Education Policy and Governance, Harvard University.
Ireson, J., Hallam, S., & Plewis, I. (2001). Ability grouping in secondary schools: Effect pupils' self-concepts. British Journal of Educational Psychology, 71, 315-326.
Jekielek, S., Cochran, S., & Hair, E. (2001). Employment programs and youth development: A synthesis. Draft report prepared for the Edna McConnell Clark Foundation. Washington, DC: Child Trends.
Jekielek, S., Hair, E., & Moore, K. (2001). Mentoring programs and youth development: A

synthesis. Prepared for the Edna McConnell Clark Foundation. Washington, DC: Child Trends.

Jimerson, S., Carlson, E., Rotert, M., Egeland, B., & Sroufe, L.A. (1997). A prospective, longitudinal study of the correlates and consequences of early grade retention. Journal of School Psychology, 35(1), 3-25.

Jordan, W.J., & Nettles, S.M. (1999). How students invest their time out of school: Effects on school engagement, perceptions of life chances, and achievement. Report No. 29. Washington, D.C.: Center for Research on the Education of Students Placed At Risk.

Kaestner, R. (1997). Are brothers really better? Sibling sex composition and educational achievement revisited. Journal of Human Resources, 32(2), 250-84.

Kaestner, R. (1997). Are brothers really better? Sibling sex composition and educational achievement revisited. Journal of Human Resources, 32(2), 250-284.

Kane, T. & Rouse, C. (1995). Labor-Market Returns to Two- and Four- Year College. The American Economic Review, 85(3), 600-14.

Kaplan, D.S., Peck, B.M., & Kaplan, H.B. (1997). Decomposing the academic failure-dropout relationship: A longitudinal analysis. The Journal of Educational Research, 90, 331-343.

Kemple, J. & Snipes, J. (March 2000). Career Academies: Impacts on students' engagement and performance in high school. New York: Manpower Demonstration Research Corporation.

King, V. (1994). Nonresident father involvement and child well-being: Can dads make a difference? Journal of Family Issues, 15, 78-96.

Klepinger, D.H., Lundberg, S., & Plotnick, R.D. Adolescent fertility and the educational attainment of young women. Family Planning Perspectives, 27(1), 23-28.

Lee, V.E. & Bryk, A.S. (1988). Curriculum tracking as mediating the social distribution of high school achievement. Sociology of Education, 61(2), 78-94.

Lee, V.E. & Smith, J.B. (1995). Effects of high school restructuring and size on early gains in achievement and engagement. Sociology of Education, 68(4), 241-270.

Lee, V.E. & Smith, J.B. (1997). High school size: Which works best and for whom? Educational Evaluation and Policy Analysis, 19 (2), 205-27.

Leventhal, T., Graber, J., & Brooks-Gunn, J. (2001). Adolescent transitions to young adulthood: Antecedents, correlates, and consequences of adolescent employment. Journal of Research on Adolescence, 11(3), 297-323.

Levine, J.A., Pollack, H., & Comfort, M.E. (2001). Academic and behavioral outcomes among the children of young mothers. Journal of Marriage and Family, 63, 355-369.

Liska, A.E., & Reed, M.D. (1985). Ties to conventional institutions and delinquency: Estimating reciprocal effects. American Sociological Review, 50, 547-560.

Ludwig, J. (1999). Information and inner city educational attainment. Economics of Education Review, 18, 17-30.

Ludwig, J. & Bassi, L. (1999). The puzzling case of school resources and student achievement. Educational Evaluation and Policy Analysis, 21(4), 385-403.

Ludwig, J., Duncan, G. & Ladd, H. (1998) The effect of MTO on Baltimore Children's Educational Outcomes. Poverty Research News, 5(1), 13-15.(Joint Center for Poverty Research).

Ludwig, J., Duncan, G., & Ladd, H. (2001). The effect of MTO on Baltimore Children's Educational Outcomes. NEWS: Joint Center for Poverty Research, 5(1), 13-15.

Mahoney, J.L. & Cairns, R.B.(1997). Do extracurricular activities protect against early school dropout? Developmental Psychology, 33(2), 241-253.

Manlove, J. (1995). Breaking the cycle of disadvantage: Ties between educational attainments, dropping out, and school-age motherhood. Paper presented at the annual meeting of the American Educational Research Association, April.

Marsh, H.W. (1991a). Employment during high school: Character building or a subversion of academic goals? Sociology of Education, 64, 172-189.

Marsh, H.W. (1991b). Failure of high ability schools to deliver academic benefits commensurate with their students' ability levels. American Educational Research Journal, 28, 445-480.

Marsh, H.W. (1994). Using the National Longitudinal Study of 1988 to evaluate theoretical models of self-concept: The self-description questionnaire. Journal of Educational Psychology, 86, 439-456.

Marsh, H.W., & Byrne, B.M. (1999). Causal ordering of academic self-concept and achievement: Reanalysis of a pioneering study and revised recommendations. Educational Psychologist, 34, 155-148.

Marsh, H.W., & Yeung, A.S. (1997). Causal effects of academic self-concept on academic achievement: Structural equation models of longitudinal data. Journal of Educational Psychology, 89, 41-54.

Marsh, H.W., & Yeung, A.S. (1998). Longitudinal structural equation models of academic self-concept and achievement: Gender differences in the development of math and English constructs. American Educational Research Journal, 35, 705-738.

Marsh, H.W., Chessor, D., Craven, R., & Roche, L. (1995). The effects of gifted and talented programs on academic self-concept: The big fish strikes again. American Educational Research Journal, 32, 285-319.

Mayer, S. (1997) Trends in the Economic Well-Being and Life Chances of America's Children. Chapter 4 in Duncan, G. & Brooks-Gunn, J., eds. Consequences of Growing up Poor. New York: Russell Sage Foundation.

McLanahan, S. (1997) Parent Absence or Poverty: Which Matters More? Chapter 3 in Duncan, G. & Brooks-Gunn, J., eds. Consequences of Growing up Poor. New York: Russell Sage Foundation.

McLanahan, S. (1985). Family structure and the reproduction of poverty. American Journal of Sociology, 90(4), 873-901.

McLanahan, S. (1985). Family structure and the reproduction of poverty. American Journal of Sociology, 90(4), 873-895.

McLanahan, S., & Sandefur, G. (1994). Growing up in with a single parent: What hurts, what helps. Cambridge, MA: Harvard University Press.

McNeal, R.B., Jr. (1995). Extracurricular activities and high school dropouts. Sociology of Education, 68(1), 62-80.

McNeal, R.B. (1999). Parental involvement as social capital: Differential effectiveness on science, achievement, truancy, and dropping out. Social Forces, 78, 117-144.

McNeal, R.B., Jr. (1997). Are students being pulled out of high school? The effect of adolescent employment on dropping out. Sociology of Education, 70, 206-220.

McPartland, J. A., & Nettles, S. M. (1991). Using community adults as advocates or mentors for at-risk middle school students: A two-year evaluation of Project RAISE. American Journal of Education 99(4), 568-586.

McWhirter, E.H., Rasheed, S., & Crothers, M. (2000). The effects of high school career education on social-cognitive variables. Journal of Counseling Psychology, 47, 330-341.

Mensch, B.S., & Kandel, D.B. (1988). Dropping out of high school and drug involvement. Sociology of Education, 61(2), 95-113.

Michelsen, E., Hair, E., Moore, K. & Zaff, J. (2001) Civic Engagement Programs and Youth Development: A Synthesis. Prepared for the Edna McConnell Clark Foundation. Washington, DC: Child Trends.

Mihalic, S.W., & Elliott, D. (1997). Short- and Long-term consequences of adolescent work. Youth & Society, 28, 464-498.

Monk, D. (1994). Subject matter preparation of secondary mathematics and science teachers and student achievement. Economics of Education Review, 13(2), 125-145

Mortimer, J.T., & Johnson, M.K. (2000). New perspectives on adolescent work and the transition to adulthood. In Richard Jessor, ed. New Perspectives on Adolescent Risk Behavior. Cambridge: Cambridge University Press.

Mortimer, J.T., Finch, M.D., Ryu, S., Shanahan, M.J., & Call, K.T. (1996). The effects of work intensity on adolescent mental health, achievement, and behavioral adjustment: New evidence from a prospective study. Child Development, 67, 1243-1261.

Mosteller, F. (1995). The Tennessee study of class size in the early school grades. The Future of Children, 5(2), 113-127.

Murdock, T.B., Anderman, L.H., & Hodge, S.A. (2000). Middle-grade predictors of students' motivation and behavior in high school. Journal of Adolescent Research, 15, 327-352.

Murnane, R. & Phillips, B. (1981). Learning by doing, vintage, and selection: Three pieces of the puzzle relating teaching experience and teaching performance. Economics of Education Review, 1fR, 4, 691-693.

Murnane, R.J., Willett, J.B., & Levy, F. (1995). The growing importance of cognitive skills in wage determination. Review of Economics and Statistics, 77, 251-266.

Myers, D., & Schrim, A. (1999). The Impacts of Upward Bound: Final Report for Phase I of the National Evaluation. Mathematica Policy Research, Inc.

Myers, D.E., Moore, K.A., Morrison, D.R., Nord, C.W., & Brown, B. (1992). Across time comparisons of the long-term consequences for women of having a child during the teen years. Paper presented at the 1992 Meetings of the Population Association of America, April 29-May 1, Denver, CO.

Myers, D., Peterson, P., Mayer, D., Chou, J., & Howell, W. (2002). School choice in New York City after two years: An evaluation of the School Choice Scholarships Program. Interim Report. Princeton, NJ: Mathematica Policy Research.

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. Report prepared for the U.S. Department of Education. Washington, DC: Author.

National Research Council and Institute of Medicine, Committee on Health and Safety Implications of Child Labor. (1998). Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States. Washington, DC: Author.

Neal, D. (1997). The effect of Catholic secondary schooling on educational attainment. Journal of Labor Economics, 15(1), 98-123.

Neal, D. The effects of Catholic Secondary Schooling on educational achievement. (1997). Journal of Labor Economics, 15(1), 98-123.

Nichols, J.D. (1996). The effects of cooperative learning on student achievement and motivation in a high school geometry class. Contemporary Educational Psychology, 467-476.

Nord, C.W., Brimhall, D., & West, J. (1997). Fathers' involvement in their children's schools, NCES 98-091. Washington, DC: National Center for Education Statistics, National Center for Education Statistics.

Nord, C.W., Moore, K.A., Morrison, D.R., Brown, B., & Myers, D.E. (1992). Consequences of teen-age parenting. Journal of School Health, 62(7), 310-318.

Northwest Regional Educational Laboratory & The National Clearinghouse for Comprehensive School Reform. (2001). Catalog of School Reform Models. Portland, OR and Washington, DC: Authors. [On-line] Available: http://www.nwrel.org/scpd/catalog/index.shtml.

Nye, B., Hedges, L.V., & Konstantopoulos, S. (1999). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. Educational Evaluation and Policy Analysis, 21(2), 127-42.

Oettinger, G. (1999). Does high school employment affect high school academic performance? Industrial and Labor Relations Review, 53(1), 136-151.

Pajares, F., & Graham, L. (1999). Self-efficacy, motivation constructs, and mathematics performance of entering middle school students. Contemporary Educational Psychology, 24, 124-139.

Phillips, M. (1997). What makes schools effective? A comparison of the relationships of communitarian climate and academic climate to mathematics achievement and attendance during middle school. American Educational Research Journal, 34, 633-662.

Redd, Z., Cochran, S., Hair, E., & Moore, K. (2001). Academic Achievement Programs and Youth Development: A Synthesis. Prepared for the Edna McConnell Clark Foundations. Washington, DC: Child Trends.

Regnerus, M.D. (2000). Shaping schooling success: Religious socialization and educational outcomes in metropolitan public schools. Journal for the Scientific Study of Religion, 39-, 363-370.

Reynolds, A.J., Mavrogenes, N.A., Bezruczko, N., & Hagemann, M. (1996). Cognitive and family-support mediators of preschool effectiveness: A confirmatory analysis. Child Development, 67, 1119-1140.

Rhodes, J., Grossman, J., & Resch, N. (2000). Agents of change: Pathways through which mentoring relationships influence adolescents' academic adjustment. Child Development, 71, 1662-1671.

Roderick, M. (1994). Grade retention and school dropout: Investigating the association. American Educational Research Journal, 31, 729-759.

Rowe, D., Vesterdal, W., & Rodgers, J. (1999). Herrnstein's syllogism: Genetic and shared environmental influences on IQ, education, and income. Intelligence, 26(4), 405-23.

Ryan, A.M. (2001). The peer group as a context for the development of youth motivation and achievement. Child Development, 72, 1135-1150.

Ryan, A.M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. American Educational Research Journal, 38, 437-460.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55, 68-78.

Sandefur, G.D., McLanahan, S., & Wojtkiewicz, R.A. (1992). The effects of parental marital status during adolescence on high school graduation. Social Forces, 71(1), 103-121.

Schinke, S.P., Cole, K., & Poulin, S.R. (2000). Enhancing the educational achievement of at-risk youth. Prevention Science, 1(1), 51-60.

Sebring, P. (1987). Consequences of differential amounts of high school coursework: Will the new graduation requirements help? Educational Evaluation and Policy Analysis, 9(3): 257-273.

Sewell, W., Hauser, R., & Wolf, W. (1980). Sex, schooling, and occupational status. American Journal of Sociology, 86(3), 551-583.

Singh, K. (1998). Part-time employment in high school and its effect on academic achievement. Journal of Educational Research, 91(3), 131–139.

Smith, T.E. (1990). Time and academic achievement. Journal of Youth and Adolescence, 19(6), 539-558.

Smith, T.E. (1992). Time use and change in academic achievement: A longitudinal follow-up. Journal of Youth and Adolescence, 21(6), 725-747.

Smith, M. H., L. J. Beaulieu, & Seraphine, A. (1995). Social capital, place of residence and college attendance. Rural Sociology, 60(3), 363-381.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. Journal of Educational Psychology, 85, 571-581.

Slavin, R.E. (1996). Research for the future. Research on cooperative learning and achievement: What we know, what we need to know. Contemporary Educational Psychology, 21, 43-69.

Steinberg, L. & Cauffman, E. The impact of employment on adolescent development. Child Development, 11, 131-166.

Steinberg, L., Lamborn, S.D., Dornbusch, S.M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed. Child Development, 63, 1266-1281.

Siu, S. (1996). Asian American students at risk: A literature review. Report No. 8. Baltimore, MD and Washington, DC: Center for Research on the Education of Students Placed at Risk.

Sun, Y. (2001). Family environment and adolescents well-being before and after parents' marital disruption: A longitudinal analysis. Journal of Marriage and Family, 63, 697-713.

Teachman, J., Paasch, K. & Carver, K. 1997. "Social Capital and the Generation of Human Capital." Social Forces, 75,1343-1360.

Temple, J., Reynolds, A., & Miedel, W. (2000). Can early intervention prevent high school drop out? Evidence from the Chicago Child-Parent Centers. Urban Education, 35(1), 31-56.

Teo, A., Carlson, E., Mathieu, P.J., Egeland, B., & Sroufe, L.A. (1996) A prospective longitudinal study of psychological predictors of achievement. Journal of School Psychology, 34(3), 285-306.

Tienda, M. & Ahituv, A. (1996). Ethnic Differences in School Departure: Does Youth Employment Promote or Undermine Educational Attainment? In G. Mangum and S. Mangum, eds. Of Heart and Mind: Social Policy Essays in Honor of Sar A. Levitan, Michigan: Upjohn Institute Press, 93-110.

Tierney, J.P., Grossman, J.B. & Resch, N.L. (1995). Making a difference: An impact study of Big Brothers/Big Sisters. Philadelphia: Public/Private Ventures.

Townsend, M.A.R., & Hicks, L. (1997). Classroom goal structures, social satisfaction and the perceived value of academic tasks. British Journal of Educational Psychology 67, 1-12.

Trusty, J. (1999). Effects of eighth-grade parental involvement on late adolescents' educational expectations. Journal of Research and Development in Education, 32, 224-233.

Trusty, J. & Harris, M.B. (1999). Lost talent: Predictors of the stability of educational expectations across adolescence. Journal of Adolescent Research, 14(3), 359-382.

Turner, S.E. (2000). A comment on "poor school funding, child poverty, and mathematics achievement." Educational Researcher, 29(5), 15-18.

U.S. Department of Education (2000). The Condition of Education. Washington, DC: National Center for Education Statistics.

Vallerand, R.J., Blais, M.R., Briere, N.M., & Pelletier, L.G. (1989). Construction et validation de l'Echelle do Motivatio en Educatio (EME) (Construction and validation of the Academic Satisfaction Scale). Canadian Journal of Behavioral Sciences, 21, 323-349.

Vanfossen, B.E., Jones, J.D., & Spade, J.Z. (1987). Curriculum tracking and status maintenance. Sociology of Education, 60, 104-122.

Wahlstrom, K., Davison, M., Choi, J, & Ross, J. (2001). School Start Time Study. Executive Summary. Minneapolis, MN: Center for Applied Research and Educational Improvement. [On-line] Available: http://education.umn.edu/CAREI/Programs/start_time/2001exec_sum.html.

Warren, J.R., LePore, P.C., & Mare, R.D. (2000). Employment during high school: Consequences for students' grades in academic courses. American Educational Research Journal, 37(4), 943-969.

Weiler, D., LaGoy, A., Crane, E., & Rovner, A. (1998). An Evaluation of K-12 Service Learning in California: Phase II Final Report. RPP International: California.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. Psychological Review, 92, 548-573.

Weng, L., Newcomb, M.D., & Bentler, P.M. (1988). Education Research Quarterly, 12(2), 8-22.

Wentzel, K.R. (1996). Social and academic motivation in middle school: Concurrent and long-term relations to academic effort. Journal of Early Adolescence, 16, 390-406.

Wentzel, K.R. (1997). Student motivation in middle school: The role of perceived pedagogical caring. Journal of Educational Psychology, 89, 411-419.

Wentzel, K.R. (1998). Social relationships and motivation in middle school: The role of parents, teachers, and peers. Journal of Educational Psychology, 90(2), 202-209.

Whitehead, J. (1984). Motives for higher education: A study of intrinsic and extrinsic motivation in relation to academic attainment. Cambridge Journal of Education, 14, 26-34.

Zaff, J.F., Moore, K.A., Papillo, A.R., & Williams, S. (2001). Implications of extracurricular activity participation during adolescence on positive outcomes. Paper presented at biennial meeting of the Society for Research in Child Development. Washington, DC: Child Trends.

Summary Table: Review of the Research Literature and Implications for Targeted Programs and Activities to Promote Educational Adjustment among Adolescents.

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Increasing academic self-concept	- Mentoring programs (though only one evaluation)			*Individual Level* - Promote increased academic achievement - Discourage adolescents' extensive employment during school-year *Family Level* - Promote increased child support from non-residential fathers *Peer Level* - Promote increased educational aspirations among adolescents' peers or alter adolescents' perceptions of their peers' educational aspirations *School Level* - Reduce the use of special classes for gifted and talented students and/or - Reduce adolescents' perceptions that their classmates are more able or talented. - Promote a moderate use of academic tracking - Promote teachers' emphasis of mutual respect between students in their classroom. *Program Level* - Counseling programs for high school and middle school students, and academic programs for middle school students, with learning disabilities

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Achievement Motivation	- Cooperative learning strategies			*Individual Level* - Promote increased academic self-concept - Promote feelings of school belonging - Decrease the level of importance students place on having friends at school - Promote interest in adhering to school rules - Decrease educational risk (e.g., educational adjustment difficulties) *Family Level* - Promote parental involvement in adolescents' education - Promote more cognitively stimulating home environments for younger children - Promote parental autonomy-granting *Peer Level* - Promote more positive achievement motivation among adolescents' peers or alter adolescents' perceptions of their peers' achievement motivation *School Level* - Increase adolescents' feelings of support from adults at school and teachers' emphasis on mutual respect between students in their classrooms. - Promote increased emphasis on mastery goals and decreased emphasis on learning goals at school (though the evidence here is mixed) - Promote teachers' autonomy granting to students

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
School engagement	- Career academies (or small learning communities) - Educational enhancement programs for at-risk youth		- Mentoring programs	*Individual Level* - Promote increased academic self-concept - Promote more positive achievement motivation (attributions for success and failure at school and intrinsic motivation) - Increase adolescents' feelings of belonging and connectedness at school - Decrease educational risk - Promote adolescents' academic achievement - Promote adolescents' enrollment in an academic track at school - Discourage adolescents' involvement in delinquent behavior - Discourage adolescents' extensive employment during school-year *Family Level* - Promote two-parent families - Discourage teenage childbearing - Promote parents' involvement and interest in adolescents' education - Promote authoritative parenting styles *Peer Level* - Promote increased educational aspirations among adolescents' peers or alter adolescents' perceptions of their peers' educational aspirations *School Level* - Discourage large school enrollment - Promote an emphasis on academics in schools - Promote increased emphasis on mastery goals and decreased

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				emphasis on learning goals at school - Increase teachers' expectations and support for adolescents' education or adolescents' perceptions of their teachers' expectations *Program Level* - Family-orientated substance abuse prevention programs - Seattle Social Development Program - School-to-work programs
Educational Expectations	- Youth employment programs - Programs aimed at fostering academic and social competence among disadvantaged high school students			*Individual Level* - Promote increased academic self-concept - Promote increased school engagement - Decrease adolescents' perceived economic limitations to education - Promote a more internal locus of control - Promote adolescents' academic achievement - Discourage school disciplinary problems - Decrease grade retention - Promote enrollment in academic track at school - Discourage adolescents' extensive employment during school-year *Family Level* - Promote increased socioeconomic status in families - Promote increased parental education - Promote two-parent families - Promote smaller families - Promote greater parental involvement in adolescents' education - Promote authoritative parenting

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				style - Promote greater parental expectations for their adolescents' education *Peer Level* - Promote increased educational aspirations among adolescents' peers or alter adolescents' perceptions of their peers' educational aspirations *School Level* - Increase school expenditures - Discourage adolescents' perceptions that they are less competent than their classmates - Promote increased teacher expectations and support for adolescents' education or adolescents' perceptions of their teachers' expectations *Program Level* - Service learning programs
Academic Achievement	-Smaller class sizes in early elementary school years (13-17 students) -Transition programs (designed to help students adjust after a transition into middle school or high school) -Academic-oriented mentoring programs		-Youth development programs with components of academic supports, programming -Vocational programs -High quality early child care program participation -Voucher programs -Smaller schools	*Individual* - Encourage academic achievement during elementary school years - Encourage adolescents to be engaged in school - Encourage adolescents to have high academic self-concept, global self-esteem - Encourage girls to engage in activities that nurture their abilities in math and science - Encourage participation among low SES youth and of low-performing youth, especially Blacks and Latinos (and some subgroups of Asians), in programs that seek to improve their academic achievement and test-taking skills

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				- Encourage participation in extracurricular activities - Encourage adolescents who wish to work to participate in the labor force during the summer months or to complete no more than 20 hours of work per week during the school year *Peers* - Encourage adolescents not to spend excessive amounts of time hanging out with peers *Family Level* - Support policies that are effective in decreasing poverty and improving socioeconomic well-being of low-income families - Support programs that are effective in increasing educational attainment of adults/parents - Encourage parents to become involved in their adolescents' lives by communicating directly with them and monitoring their activities. - Support child support enforcement policies - Support programs that are effective in improving home environment during early years - Support programs that are effective in decreasing maternal life stress - Discourage adolescents from hanging out with peers without parental supervision for long amounts of time *School/Neighborhood Level* - Encourage schools with adolescents coming from a

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				variety of SES backgrounds - Encourage comprehensive public schools to adopt some of the structural features of Catholic schools and magnet public schools (more fluid tracking system, cooperative, communitarian school climate, etc.) - Encourage secondary school teachers to have content specific training or certification, especially in the subject of math - Encourage programs found to increase representation of teachers of both sexes, and from diverse racial and ethnic, socioeconomic backgrounds *Societal/PolicyLevel* - Support policies effective in increasing marital stability- Encourage preschool aged children to watch educational programming *Program Level* - Service learning programs
High School Completion/ Reduce High School Dropout	-Academic-oriented mentoring programs		-Participation in youth development programs with academic supports, programming -Vocational programs -High quality early child care program participation	*Individual* - Encourage participation in programs that improve adolescents' academic achievement - Encourage involvement in extracurricular activities - Discourage drug use during adolescence - Discourage early fertility/parenthood (during middle or high school years) - Encourage students to have high social psychological well-being self-esteem, perceived academic ability, educational aspirations) - Discourage problem behavior and aggressive behavior

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				- Discourage working long hours during school year (over 20 hours per week) - Discourage working long hours in manufacturing and service fields during adolescence - Decrease grade failure/repetition among students and increase effective alternate policies for students who are failing academically, so that grade retention is resorted to less - Encourage adolescents from low SES backgrounds, especially low-income Latinos and Whites, to participate in programs designed to increase high school completion *Peers* - Encourage adolescents to befriend high achieving youth who aspire to graduate from high school - Encourage antisocial adolescents to establish friendships with their peers *Family* - Support policies that are effective in decreasing poverty and improving socioeconomic well-being of low-income families - Support programs that are effective in increasing educational attainment of adults/parents - Support programs that have been effective in improving marital stability - Support programs that have been effective in aiding families with disabled heads - Increase number of educational resources in homes

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				Neighborhood/Community/School - Establish residence during childhood in mixed SES neighborhoods with low levels of students dropping out of high school - Encourage enrollment in academic track - Encourage public high schools to adopt similar structural practices as Catholic schools - Establish smaller schools - Discourage mobility between neighborhoods/schools during adolescence *Societal/Policy* - Encourage and enforce state policies on later age of legal school drop out - *Program Level* - Service learning programs
Postsecondary attendance and attainment	-Mentoring programs		-Youth development programs with incorporated academic supports, programming -Vocational programs - High quality early child care program participation	*Individual* - Increase participation in extracurricular activities during high school - Discourage early fertility/ parenthood - Encourage adolescents' educational aspirations during secondary schooling years - Discourage long hours of work (over 15-20 hours per week) during the school year among high school youth - Encourage psychological well-being and positive scholastic behavioral characteristics among male adolescents (academic self-concepts, school effort, aspirations, grades) - Increase number of and/or encourage participation in work-study programs for college

BEST COPY AVAILABLE

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				students *Family* - Support policies that are effective in decreasing poverty and improving socioeconomic well-being of low-income families - Support programs that are effective in increasing educational attainment of adults/parents - Encourage children of mothers born outside of the United States to attend college *Neighborhood/Community/School* - Encourage adolescents to take classes in the academic and college prep tracks - Encourage academic achievement during secondary schooling years - Encourage high school students to take rigorous high level math and science classes and other classes required by colleges - Encourage public schools to adopt structures similar to those of Catholic schools - Encourage smaller teacher-pupil ratios - Encourage schools that are racially and ethnically representative *Program level* - Service learning programs

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

[X] This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

[ ] This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").